SONY

HD DIGITAL VIDEO SWITCHER

# HDS-7150/7100

POWER SUPPLY UNIT

# HKDS-7695

SWITCHER CONTROL PANEL

# BKDS-7017/2010

DME CONTROL PANEL

# BKDM-3010

**HKDS-7031**

**HKDS-7051**

**HKDS-7061**

**HKDS-7071**

**HZS-7040**

**HZS-7060**

**BKDS-7001**

**BKDS-7003**

**BKDS-7030**

**BKDS-7031**

**BKDS-7033**

**BKDS-7075**

**BKDS-7091**

Digital HDVS

MAINTENANCE MANUAL Part 1

1st Edition

## ⚠警告

このマニュアルは，サービス専用です。
お客様が，このマニュアルに記載された設置や保守，点検，修理などを行うと感電や火災，人身事故につながることがあります。
危険をさけるため，サービストレーニングを受けた技術者のみご使用ください。

## ⚠WARNING

This manual is intended for qualified service personnel only.
To reduce the risk of electric shock, fire or injury, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

## ⚠WARNUNG

Die Anleitung ist nur für qualifiziertes Fachpersonal bestimmt.
Alle Wartungsarbeiten dürfen nur von qualifiziertem Fachpersonal ausgeführt werden. Um die Gefahr eines elektrischen Schlages, Feuergefahr und Verletzungen zu vermeiden, sind bei Wartungsarbeiten strikt die Angaben in der Anleitung zu befolgen. Andere als die angegeben Wartungsarbeiten dürfen nur von Personen ausgeführt werden, die eine spezielle Befähigung dazu besitzen.

## ⚠AVERTISSEMENT

Ce manual est destiné uniquement aux personnes compétentes en charge de l'entretien. Afin de réduire les risques de décharge électrique, d'incendie ou de blessure n'effectuer que les réparations indiquées dans le mode d'emploi à moins d'être qualifié pour en effectuer d'autres. Pour toute réparation faire appel à une personne compétente uniquement.

| | |
|---|---|
| HDS-7150 | Serial No. 10001 and Higher |
| HDS-7100 | Serial No. 10001 and Higher |
| HKDS-7695 | Serial No. 10001 and Higher |
| BKDS-7017 | Serial No. 10001 and Higher |
| BKDS-2010 | Serial No. 10001 and Higher |
| BKDM-3010 | Serial No. 10001 and Higher |
| HKDS-7031 | Serial No. 10001 and Higher |
| HKDS-7051 | Serial No. 10001 and Higher |
| HKDS-7061 | Serial No. 10001 and Higher |
| HKDS-7071 | Serial No. 10001 and Higher |
| HZS-7040 | Software Version 1.00 and Later |
| HZS-7060 | Software Version 1.00 and Later |
| BKDS-7001 | Serial No. 10001 and Higher |
| BKDS-7003 | Serial No. 10001 and Higher |
| BKDS-7030 | Serial No. 10001 and Higher |
| BKDS-7031 | Serial No. 10001 and Higher |
| BKDS-7033 | Serial No. 10001 and Higher |
| BKDS-7075 | Serial No. 10001 and Higher |
| BKDS-7091 | Serial No. 10001 and Higher |

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# Manual Structure

## Purpose of this manual

This manual is the maintenance manual part 1 of HD Digital Video Switcher HDS-7150/7100 and their optional boards and units.
This manual is intended for use by trained system and service engineers, and describes the information for general service and periodic maintenance with the intention of servicing including the replacement of the principal blocks and mounted circuit boards.

## Related manuals

The following manuals are prepared for HDS-7150/7100 and their optional boards and units.

- **User's Guide (Supplied with HZS-7040)**
  This manual describes the application and operation of HDS-7150 system.

- **User's Guide (Supplied with HZS-7060)**
  This manual describes the application and operation of HDS-7100 system.

- **Operation Manual (Supplied with HDS-7150/7100)**
  This manual describes the overview, system configuration examples, and specifications of optional boards and units.

- **Installation Manual (Supplied with HDS-7150/7100)**
  This manual describes the information related to the installation of HDS-7150/7100 system.

- **Maintenance Manual Part2 (Available on request)**
  Volume1: Service instruction
  Volume2: Spare parts list, Semiconductors list, Block diagrams, Frame wiring, and Board layouts

  These manuals describe the detailed service information.
  If these manuals are required, please contact your local Sony Sales Office/Service Center.

- **"Semiconductor Pin Assignments" CD-ROM (Available on request)**
  This "Semiconductor Pin Assignments" CD-ROM allows you to search for semiconductors used in Broadcasting & Professional Systems Company equipment.
  Semiconductors that cannot be searched for on this CD-ROM are listed in the service manual for the corresponding unit. The service manual contains a complete list of all semiconductors and their ID Nos., and thus should be used together with the CD-ROM.
  Part number: 9-968-546-01

## Contents

This manual is organized by following sections.

**Section 1 HDS-7150/7100 Service Overview**
This section describes the removal of cabinets, location of main parts, installation/ removal of boards, capacitor for data backup, and spare parts.

**Section 2 BKDS-7017 Service Overview**
**Section 3 BKDS-2010 Service Overview**
**Section 4 BKDM-3010 Service Overview**
These sections describe opening and closing panel, location of the main parts, replacing the main parts, and spare parts.

**Section 5 Troubleshooting**
This section describes the troubleshooting of the BKDS-2010/BKDM-3010.

**Section 6 Diagnostics**
This section describes the self-diagnosis of the control panels.

**Section 7 Periodic Maintenance and Inspection**
This section describes the parts required a cleaning.

**Section 8 Overall Block Diagrams**
This section describes the overall block diagrams.

# Section 1
# HDS-7150/7100 Service Overview

## 1-1. Removal of Cabinets

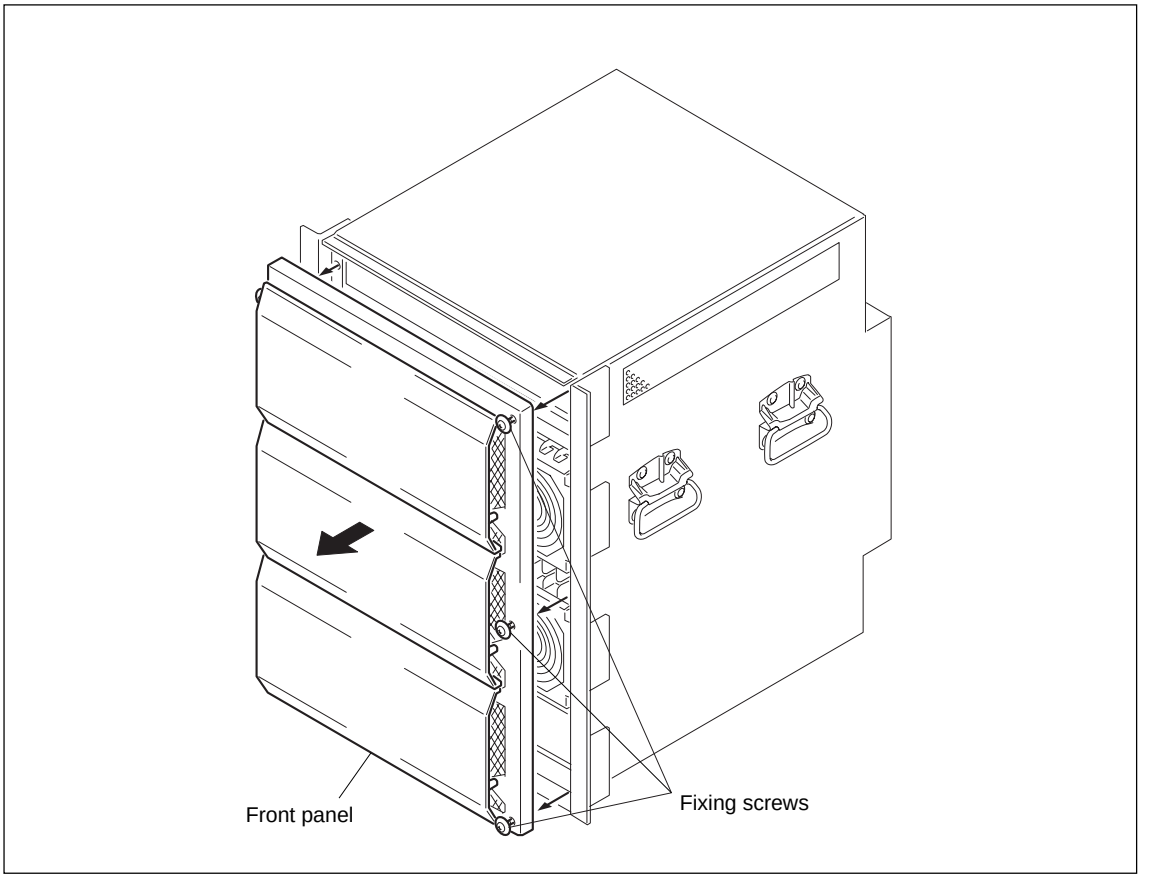
### 1-1-1. Removal of Front Panel

(1) Loosen the six fixing screws on the front panel.

**Note**

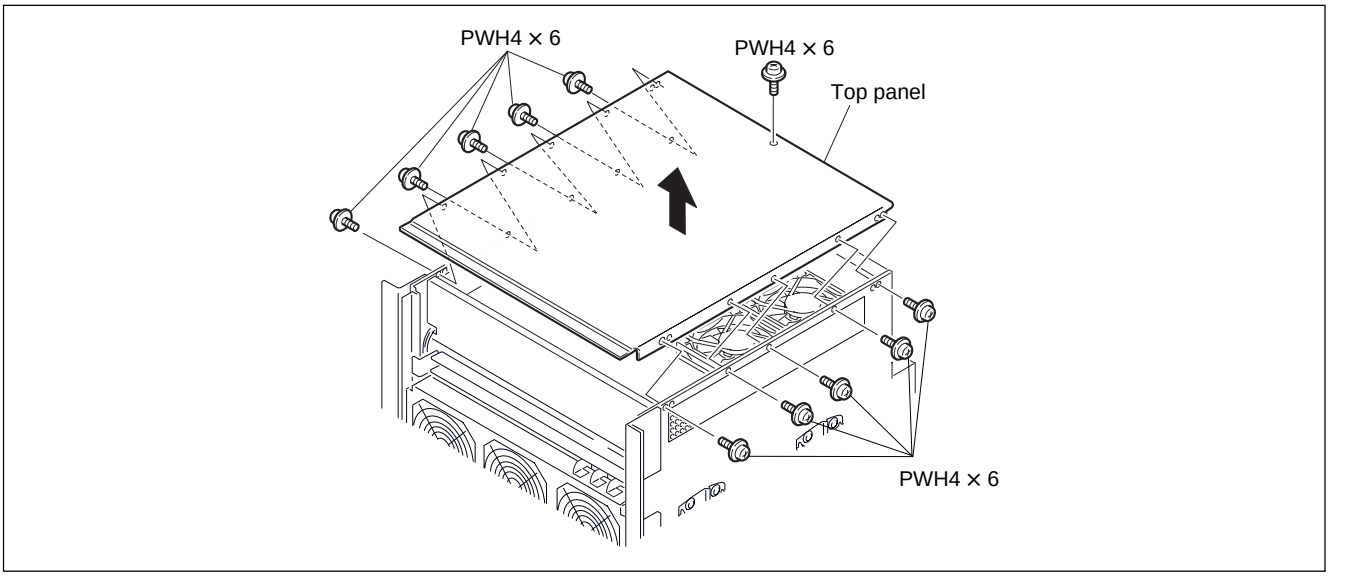
The screws have the drop-safe.

(2) Remove the front panel in the direction of the arrow.



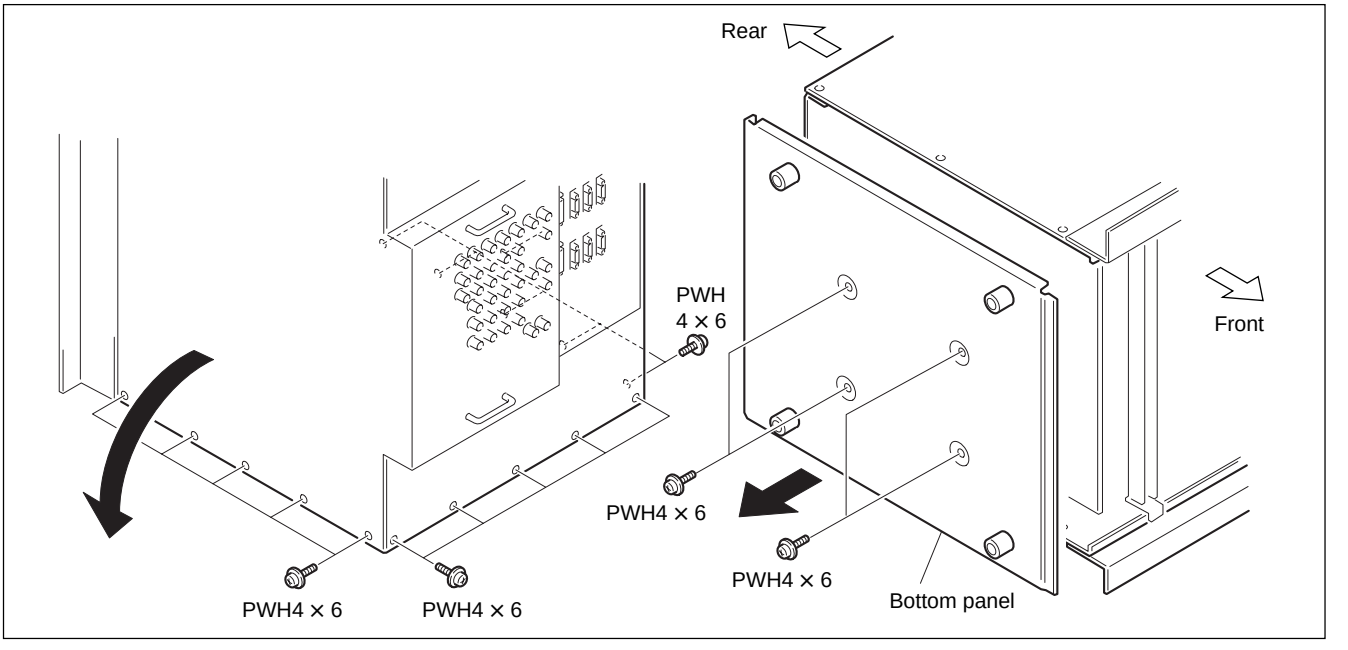
## 1-1-2. Removal of Top Panel

(1) Remove the front panel. (Refer to Section 1-1-1.)
(2) Remove the eleven screws and remove the top panel.




## 1-1-3. Removal of Bottom Panel

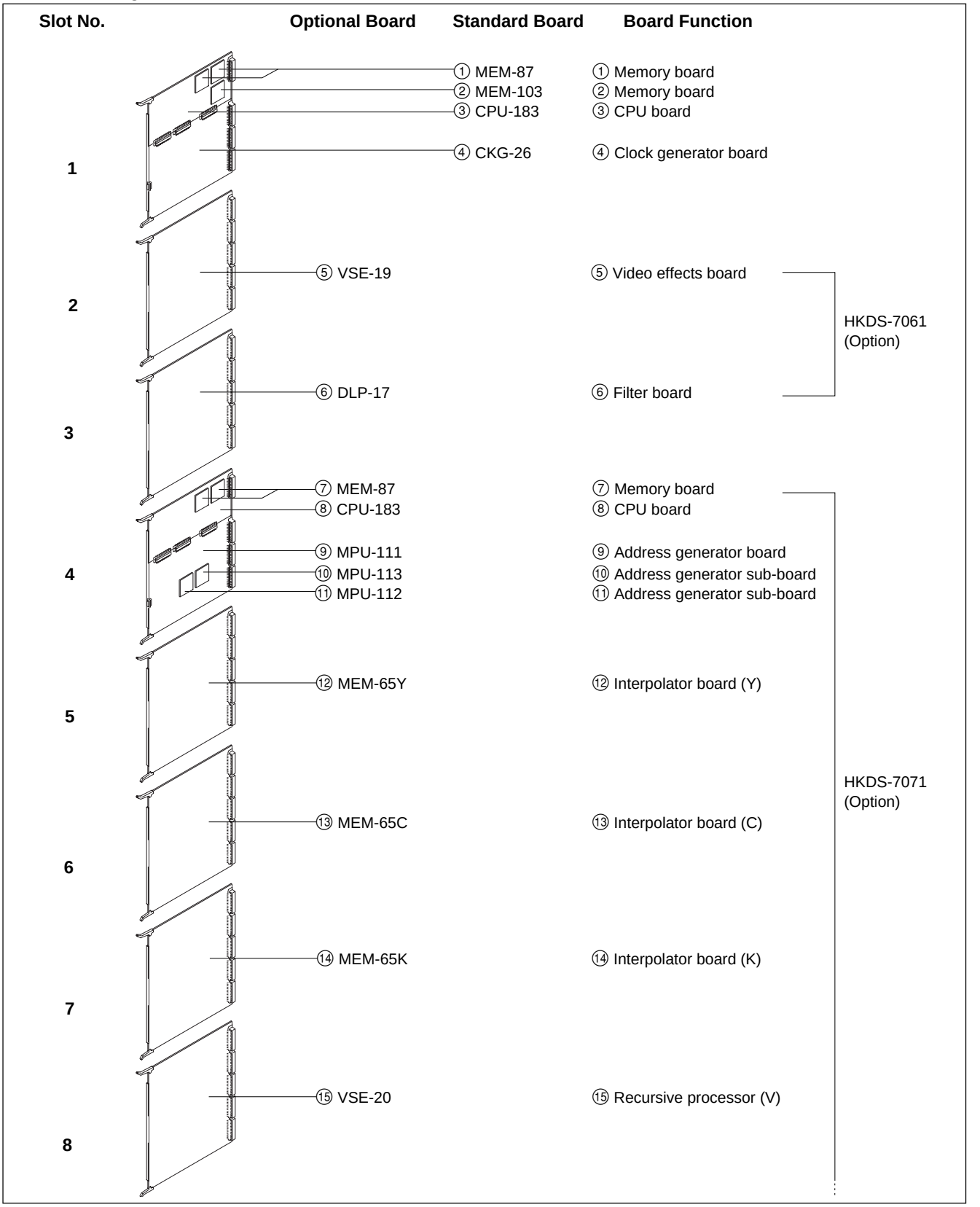
(1) Remove the front panel. (Refer to Section 1-1-1.)
(2) Remove the fifteen screws.
(3) Turn the unit the right side panel of the unit to the bottom.
(4) Remove the four screws and remove the bottom panel.

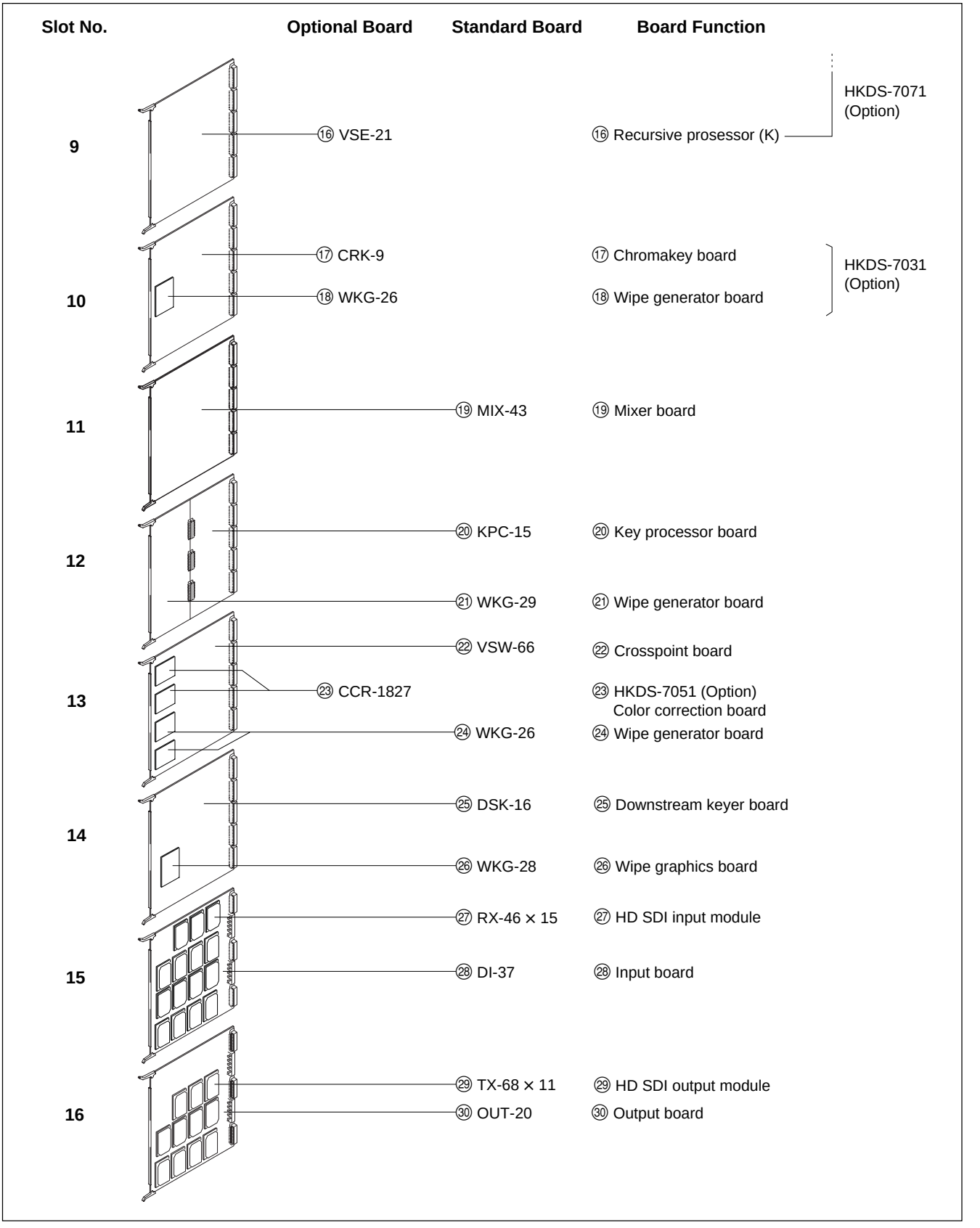


# 1-2. Location of Main Parts

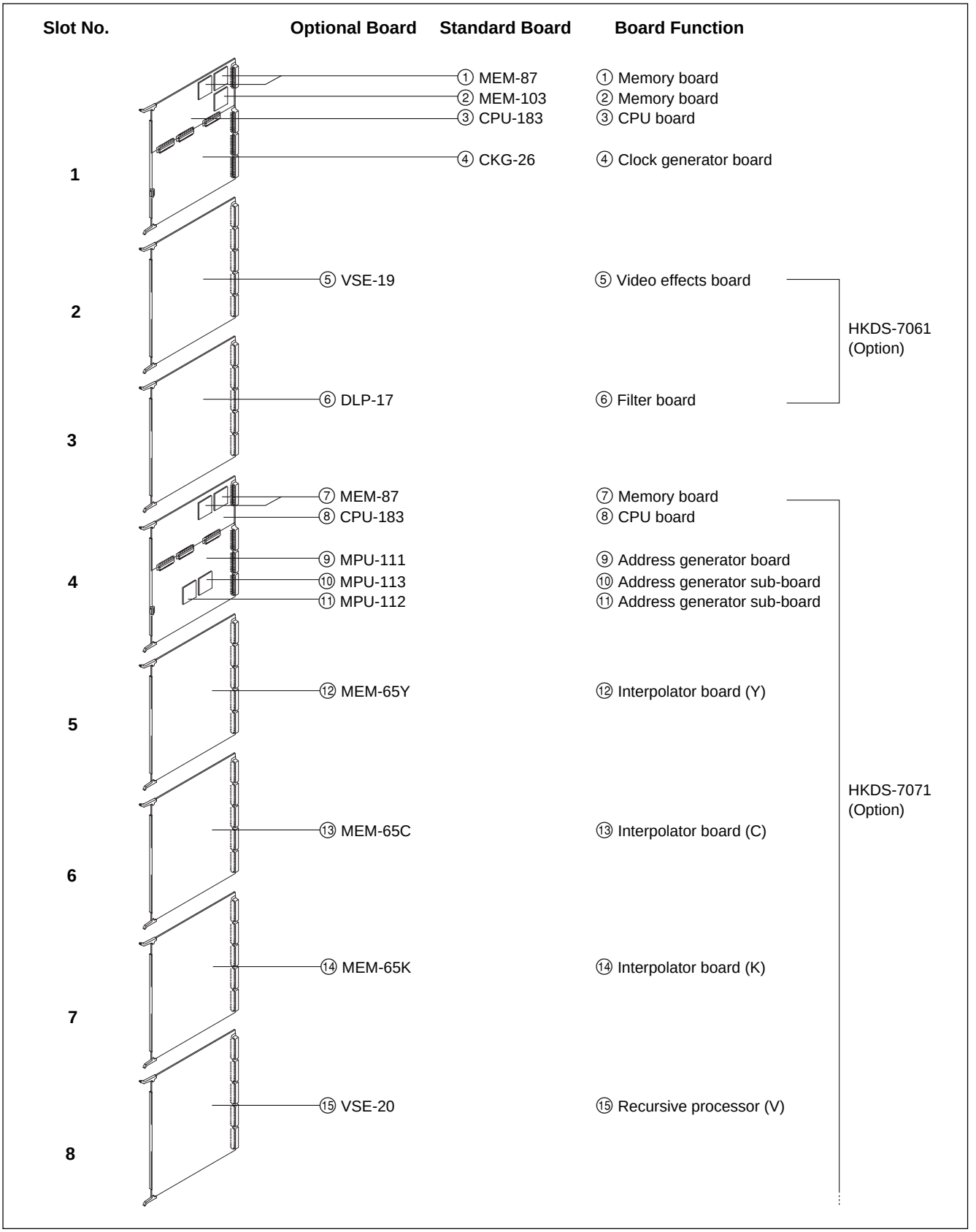
## 1-2-1. Plug-in Boards

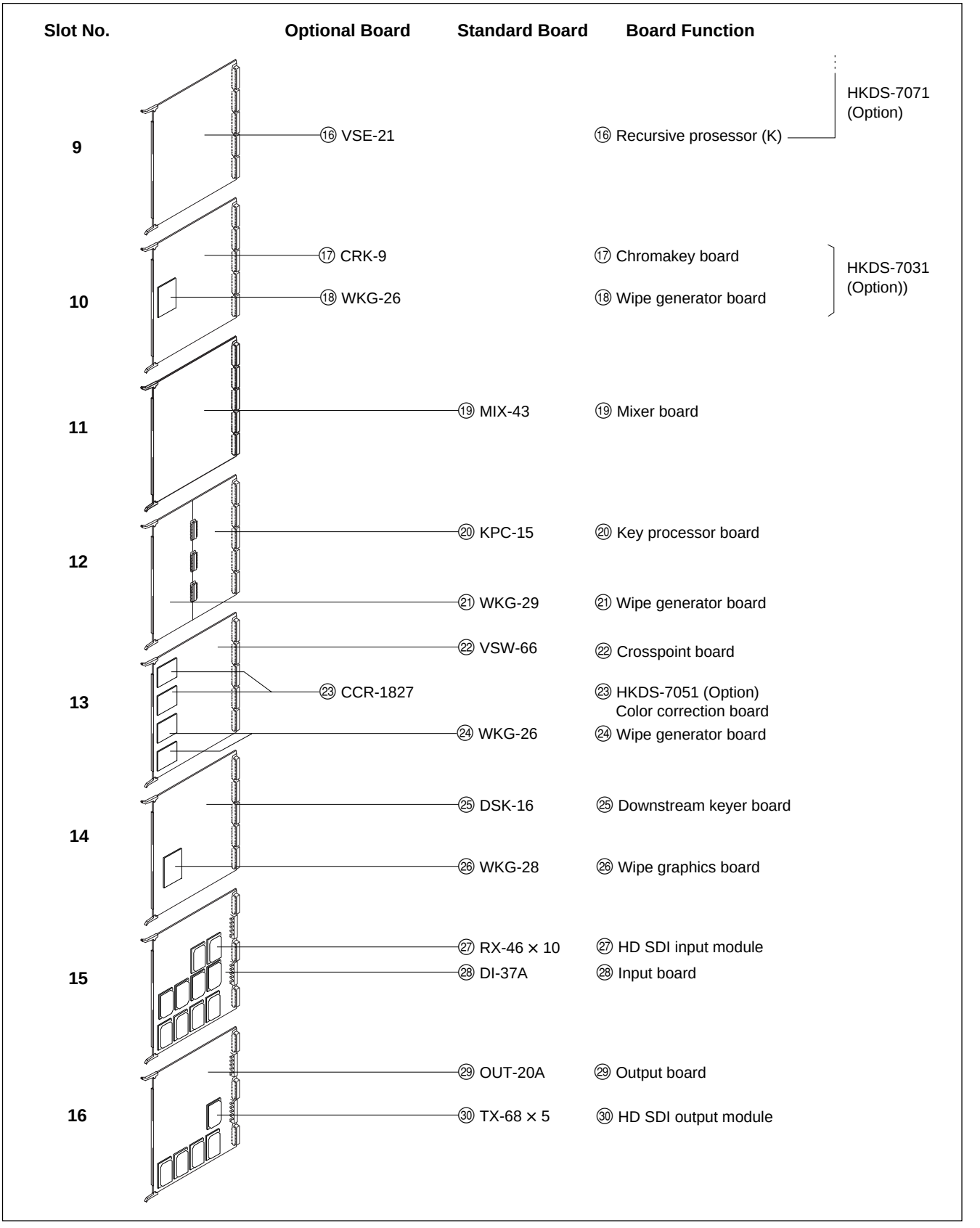
### HDS-7150 Plug-in Boards




Slot No.
Optional Board
Standard Board
Board Function
9
⑯ VSE-21
⑯ Recursive prosessor (K)
HKDS-7071
(Option)
10
⑰ CRK-9
⑱ WKG-26
⑰ Chromakey board
⑱ Wipe generator board
HKDS-7031
(Option)
11
⑲ MIX-43
⑲ Mixer board
12
⑳ KPC-15
㉑ WKG-29
⑳ Key processor board
㉑ Wipe generator board
13
㉒ VSW-66
㉓ CCR-1827
㉔ WKG-26
㉒ Crosspoint board
㉓ HKDS-7051 (Option)
Color correction board
㉔ Wipe generator board
14
㉕ DSK-16
㉖ WKG-28
㉕ Downstream keyer board
㉖ Wipe graphics board
15
㉗ RX-46 × 15
㉘ DI-37
㉗ HD SDI input module
㉘ Input board
16
㉙ TX-68 × 11
㉚ OUT-20
㉙ HD SDI output module
㉚ Output board

## HDS-7100 Plug-in Boards




Slot No.
Optional Board
Standard Board
Board Function
9
⑯ VSE-21
⑯ Recursive prosessor (K)
HKDS-7071
(Option)
10
⑰ CRK-9
⑱ WKG-26
⑰ Chromakey board
⑱ Wipe generator board
HKDS-7031
(Option))
11
⑲ MIX-43
⑲ Mixer board
12
⑳ KPC-15
㉑ WKG-29
⑳ Key processor board
㉑ Wipe generator board
13
㉒ VSW-66
㉓ CCR-1827
㉔ WKG-26
㉒ Crosspoint board
㉓ HKDS-7051 (Option)
Color correction board
㉔ Wipe generator board
14
㉕ DSK-16
㉖ WKG-28
㉕ Downstream keyer board
㉖ Wipe graphics board
15
㉗ RX-46 × 10
㉘ DI-37A
㉗ HD SDI input module
㉘ Input board
16
㉙ OUT-20A
㉚ TX-68 × 5
㉙ Output board
㉚ HD SDI output module

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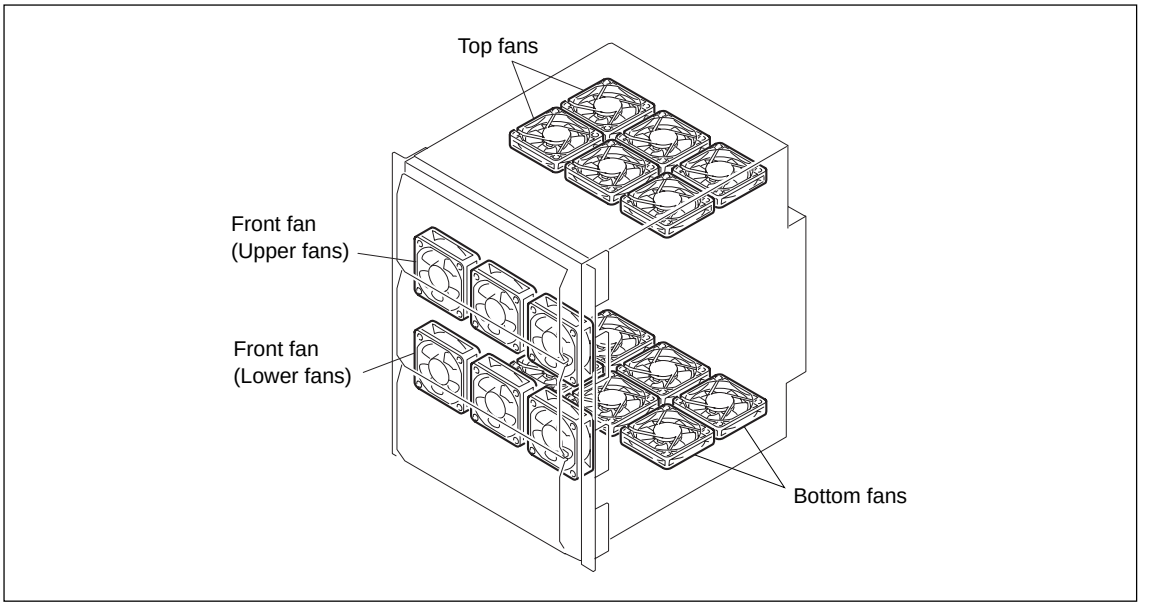
## 1-2-2. Fan



# 1-3. Replacement of Main Parts

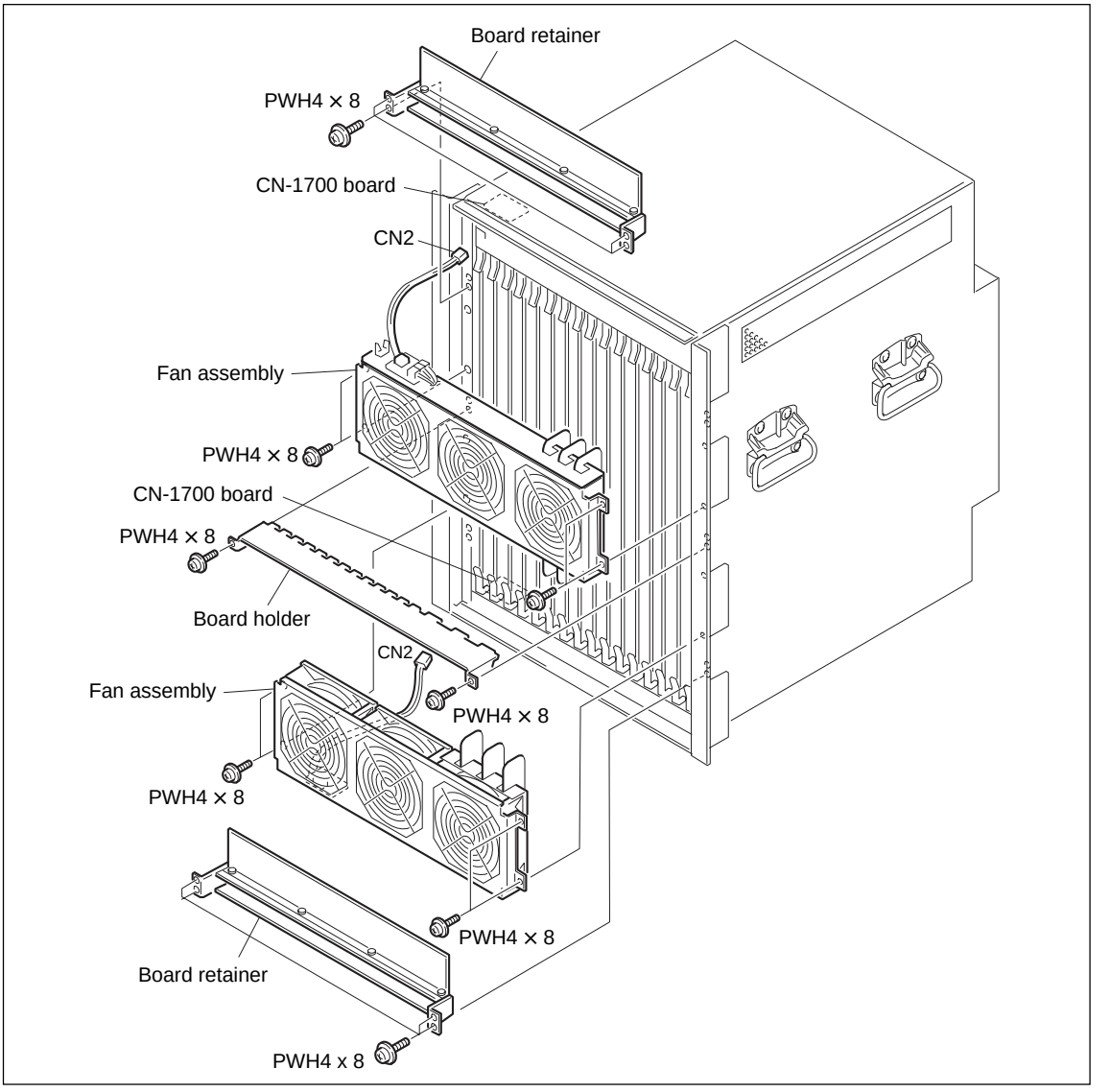
**CAUTION**

Before replacing the parts, be sure to turn off the power switch (HKDS-7695). When the redundant power supply is used, turn off the both power switches. If not, it will damage the boards or cause an electric shock.

## 1-3-1. Replacement of Plug-in Boards

### Removal

(1) Remove the front panel. (Refer to Section 1-1-1.)
(2) Remove the ten screws on the two board retainers and the board holder.
(3) Disconnect the two connectors (CN2) from the CN-1700 boards.
(4) Remove the eight screws on the two fan assemblies.



(5) Open the eject levers of the plug-in board in the direction of the arrow ①.
(6) Pull out the plug-in board.

**Note**

Pull out the plug-in board while applying forces to both eject levers equally.

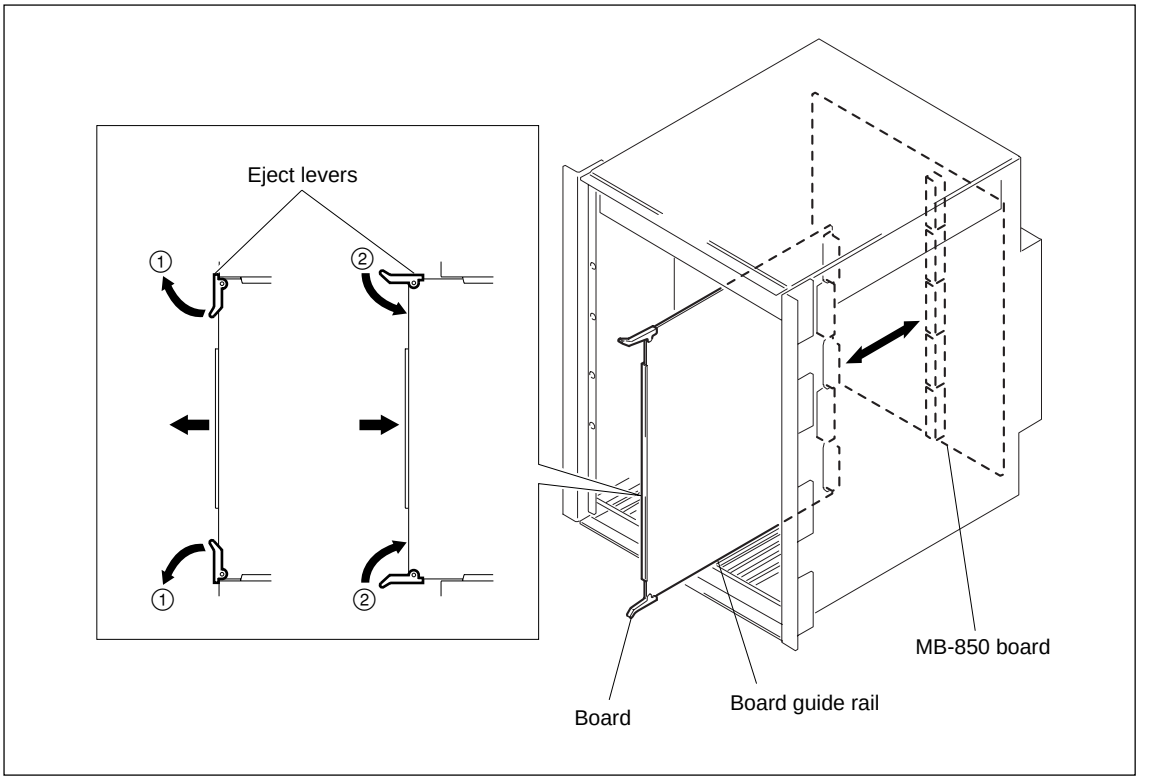
## Installation

(1) Insert the plug-in board along the board guide rails while putting the eject levers to ① position as shown in the figure.
(2) After pushing in the plug-in board, close the eject levers in the direction of the arrow ②.

**Note**

Confirm that the connectors of the plug-in board are connected to the MB-850 board completely.

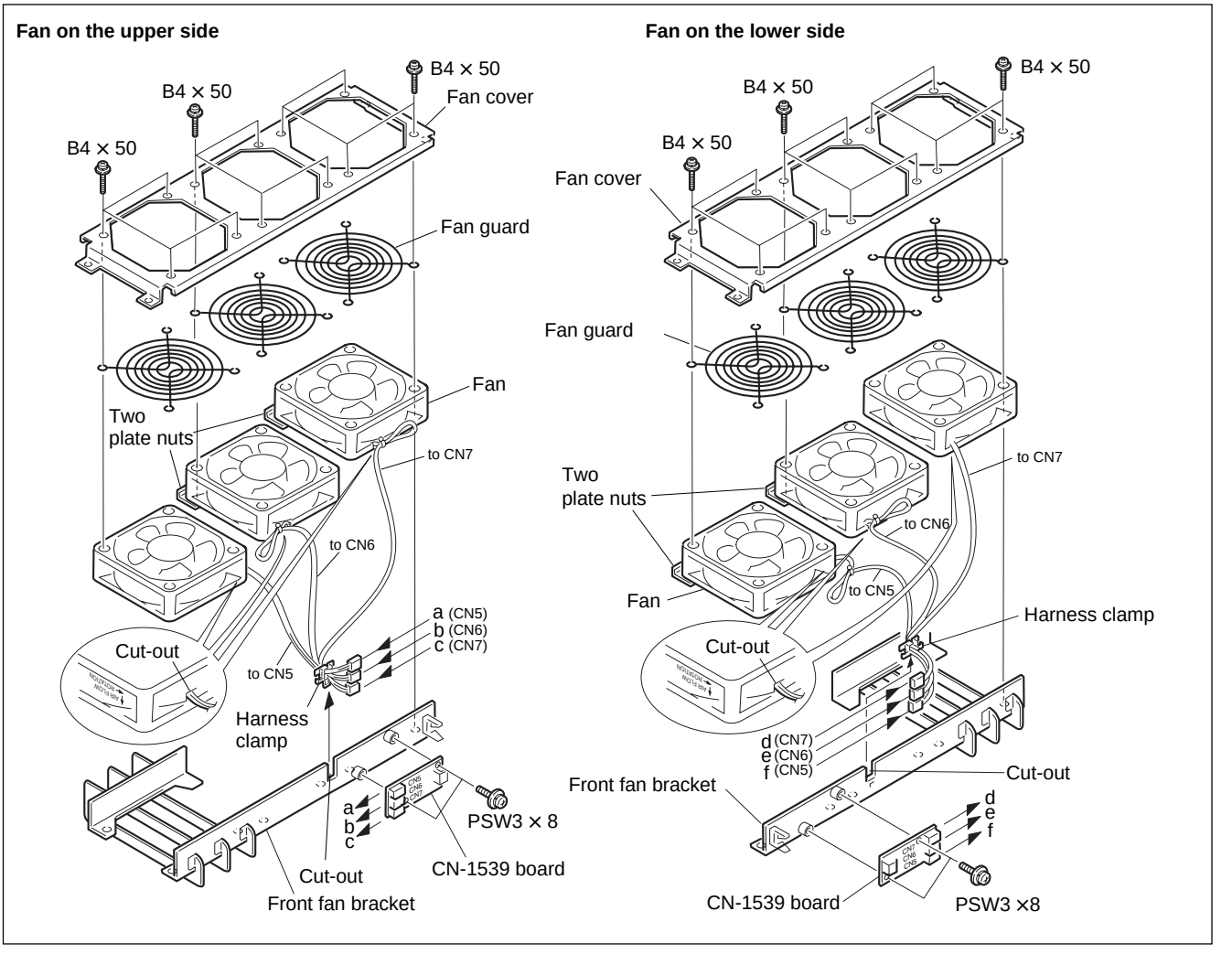
(3) Install the two board retainers, the one board holder, and the two fan assemblies in the reverse order of the removal precedure (1) through (4).



## 1-3-2. Replacement of Front Fan

If the fan stops under the normal operating, the control panel indicates the alarm message on the display panel. If indicated, replace the fan.
And if the fan is used over a prolonged period, the rotation speed is getting low by wearing. If the unit is continuously used, periodically replace the fan about every two years.

(1) Remove the front panel. (Refer to Section 1-1-1.)
(2) Remove the fan assembly. (Refer to Section 1-3-1.)
(3) Remove the twelve screws securing the fan cover, and remove the fan guards and two plate nuts.
(4) Disconnect the three connectors from the CN-1539 board, and remove the harness clamper fixed by the cut-out of the front fan bracket.
(5) Remove the harness coming from the fan to be replaced from the harness clamp, and remove the fan.



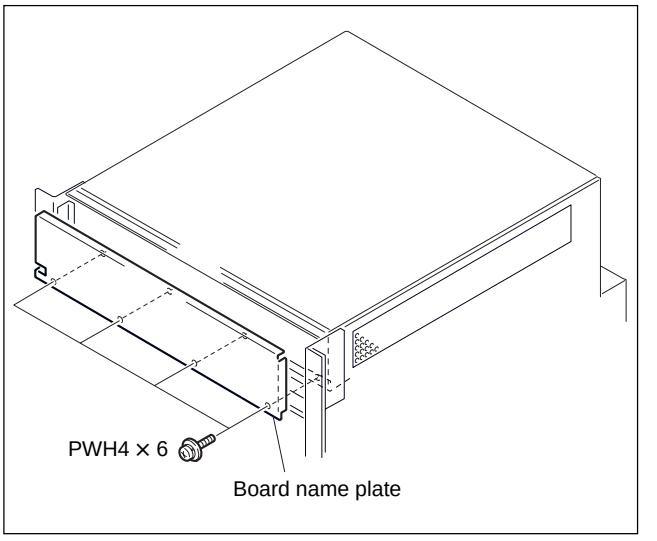

(6) Install a new fan by reversing the disassembly procedure of the steps (1) through (5).

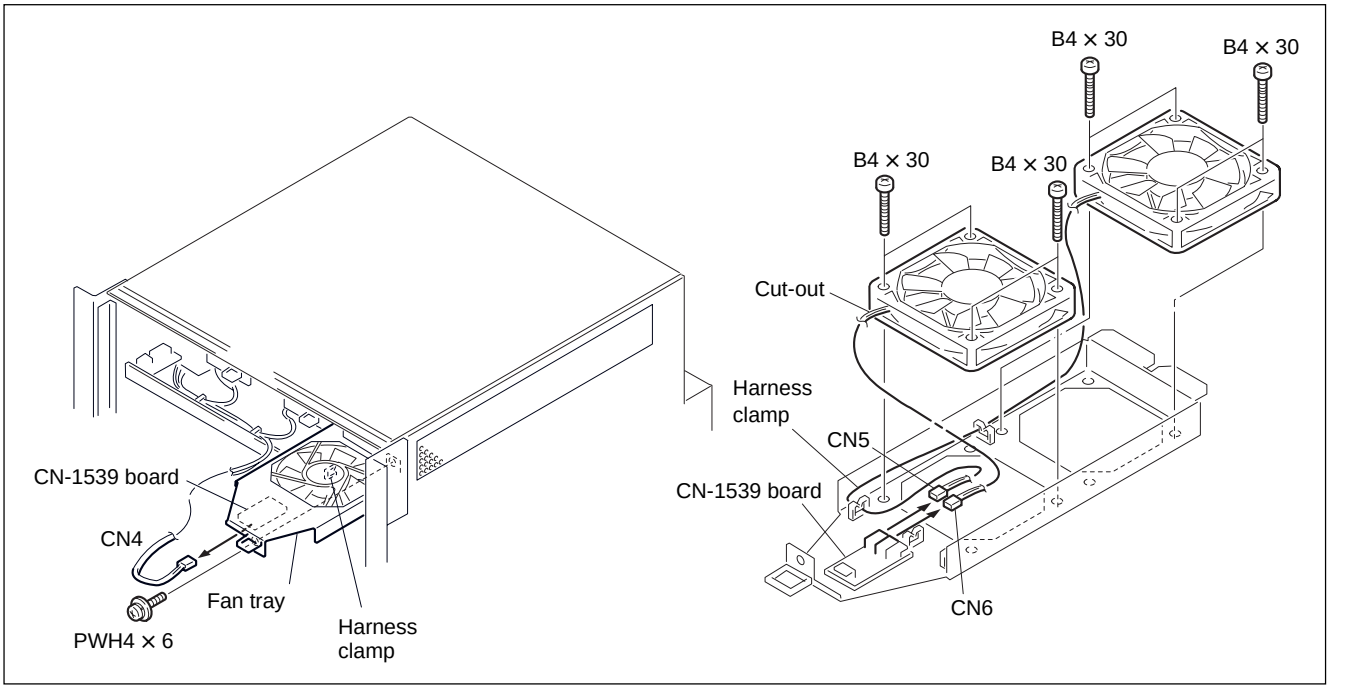
**Notes**

- When installing the fan, take care the direction of the airflow.
- Before installing the fan, put the harness through the cut-out of the fan. After installing the fan, pulll the harness and secure the harness to the harness clamper.
  If loosening the harness, the harness will be pintched while the fan is rotating.

## 1-3-3. Replacement of Fan on the Top Side

(1) Remove the front panel. (Refer to Section 1-1-1.)
(2) Remove the four screws, and remove the board name plate.
(3) Remove the harness from the harness clamp.
(4) Remove the screw securing the fan tray of the fan to be replaced.
(5) Pull the fan tray toward you.
(6) Disconnect the connector (CN4) from the CN-1539 board.
(7) Pull out the fan tray from the unit.
(8) Remove the four screws securing the fan to be replaced.
(9) Disconnect the connector of the fan to be replaced from the CN-1539 board and remove the fan.
For the front fan : CN6
For the rear fan : CN5



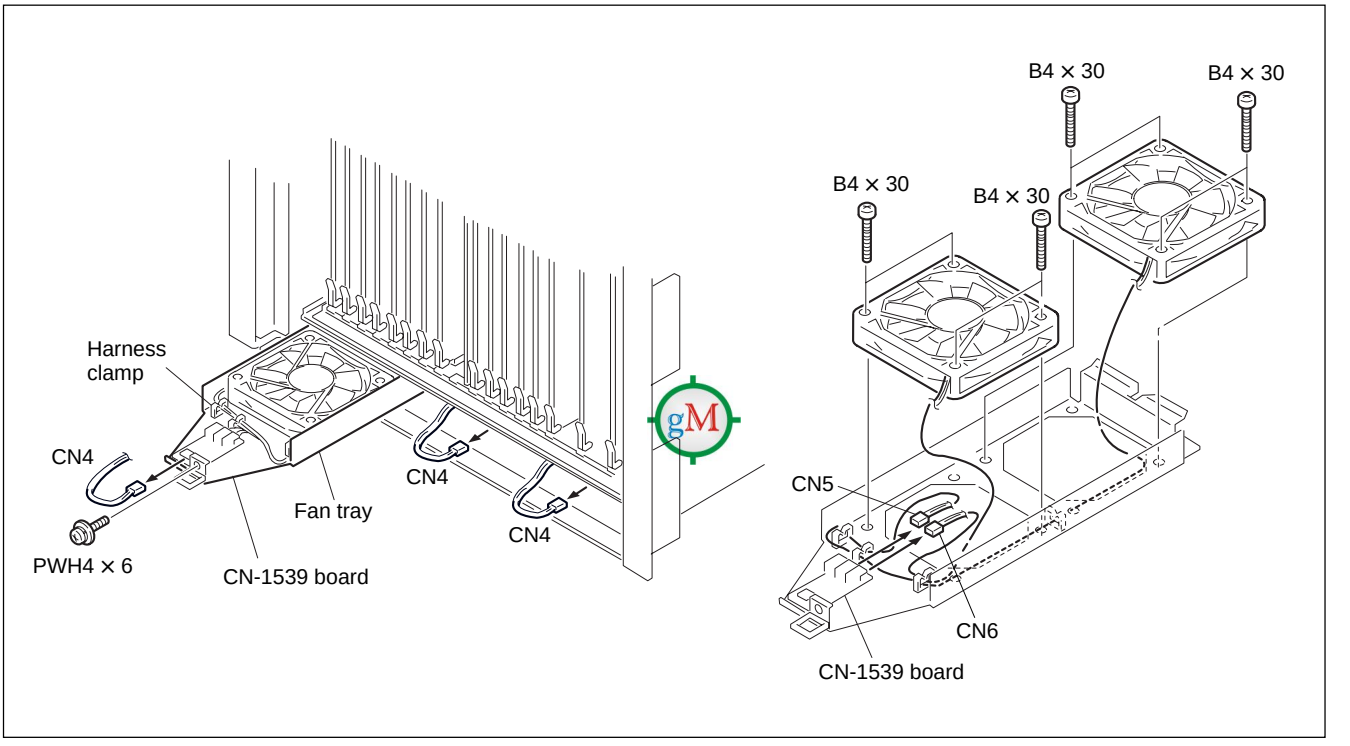

(10) Install a new fan in by reversing the disassembly procedure of the steps (1) through (9).

**Notes**

- When installing the fan, take care the direction of the airflow.
- Before installing the fan, put the harness through the cut-out of the fan. After installing the fan, pulll the harness and secure the harness to the harness clamp.
  If loosening the harness, the harness will be pintched while the fan is rotating.

## 1-3-4. Replacement of Fan on the Bottom Side

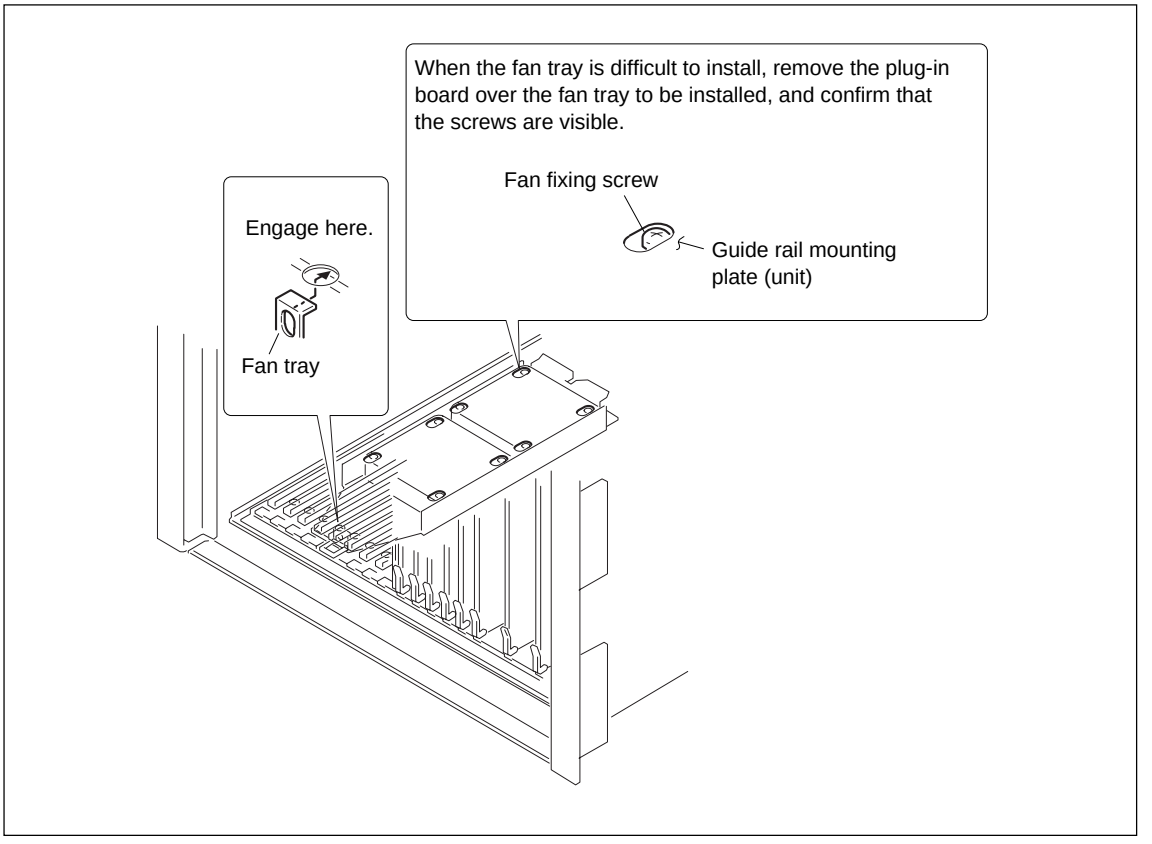
(1) Remove the front panel. (Refer to Section 1-1-1.)
(2) Remove the harness from the harness clamper.
(3) Remove the screw of securing the fan tray of the fan to be replaced.
(4) Pull the fan tray toward you.
(5) Disconnect each connector (CN4) from the CN-1539 board.
(6) Pull out the fan tray from the unit.
(7) Remove the four screws securing the fan to be replaced.
(8) Disconnect the connector of the fan to be replaced from the CN-1539 board and remove the fan.
For the front fan : CN6
For the rear fan : CN5




(9) Install a new fan by reversing the disssembly procedure order of steps (1) through (8).

**Notes**

- When installing the fan, take care the direction of the airflow.
- Before installing the fan, put the harness through the cut-out of the fan. After installing the fan, pulll the harness and secure the harness to the harness clamp.
  If loosening the harness, the harness will be pintched while the fan is rotating.
- Install the fan tray in the unit with caring the following comments described below.


When the fan tray is difficult to install, remove the plug-in board over the fan tray to be installed, and confirm that the screws are visible.
Fan fixing screw
Guide rail mounting plate (unit)
Engage here.
Fan tray

## 1-4. Charge of Capacitor for Data Backup

To store a setup data and a real-time clock, the large storage capacitor is mounted on the CPU-183 and CKG-26 boards in the HDS-7150/7100.
To charge the large storage capacitor sufficiently, turn on the power of the HDS-7150/7100 for more than about thirty minutes. The sufficiently charged large storage capacitor enables data to be stored for about one week in the normal temperature.

## 1-5. Spare Parts

When ordering the boards and main parts, refer to the parts names and the parts numbers listed below.

### Replacement Parts

HDS-7150/7100

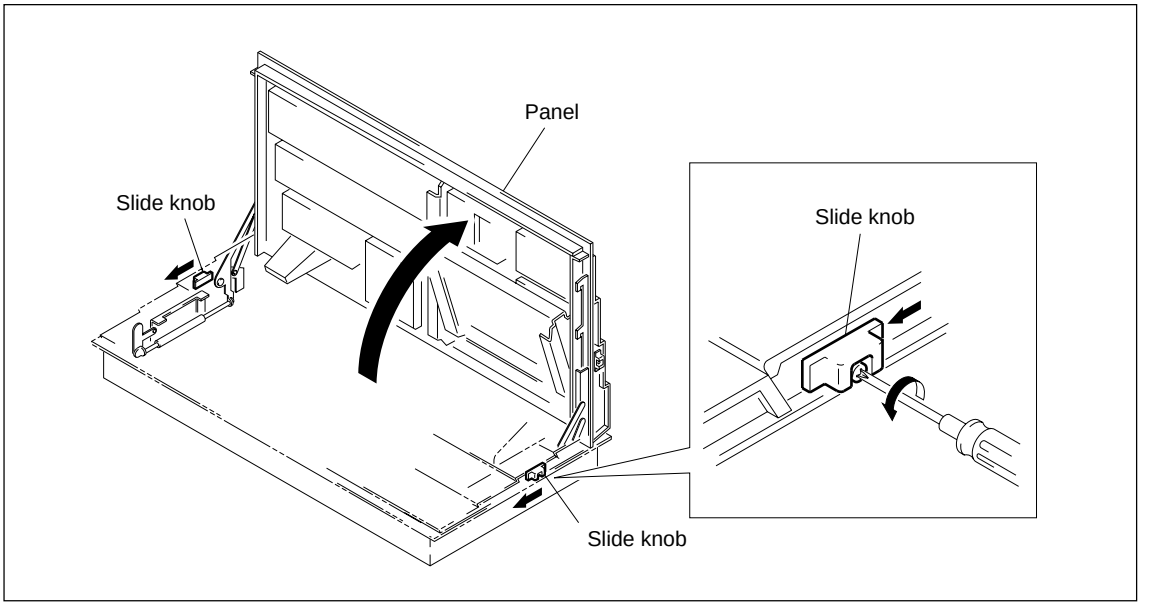
| Parts name | Parts No. |
|---|---|
| CCR-1827 Board | A-8322-212-A |
| CKG-26 Board | A-8322-208-A |
| CPU-183 Board | A-8317-510-A |
| DI-37 Board | A-8322-472-A |
| DI-37A Board | A-8322-428-A |
| DLP-17 Board | A-8317-508-A |
| DSK-16 Board | A-8322-206-A |
| KPC-15 Board | A-8322-468-A |
| MEM-87 Board | A-8317-512-A |
| MEM-103 Board | A-8322-214-A |
| MIX-43 Board | A-8322-470-A |
| OUT-20 Board | A-8322-409-A |
| OUT-20A Board | A-8322-430-A |
| VSW-66 Board | A-8322-204-A |
| WKG-28 Board | A-8322-215-A |
| WKG-29 Board | A-8322-466-A |
| WKG-26 Board | A-8317-494-A |
| DC Fan Motor (Top/Bottom) | 1-763-092-11 |
| DC Fan Motor (Front) | 1-698-873-11 |
| CRK-9 Board | Option HKDS-7031 |
| RX-46* Board | Option HK-202 |
| TX-68* Board | Option HK-201 |

* : Use RX-46 or TX-68 board after removing the cover of HK-202 or HK-201.

# Section 2
# BKDS-7017 Service Overview

## 2-1. Opening and Closing of Panel

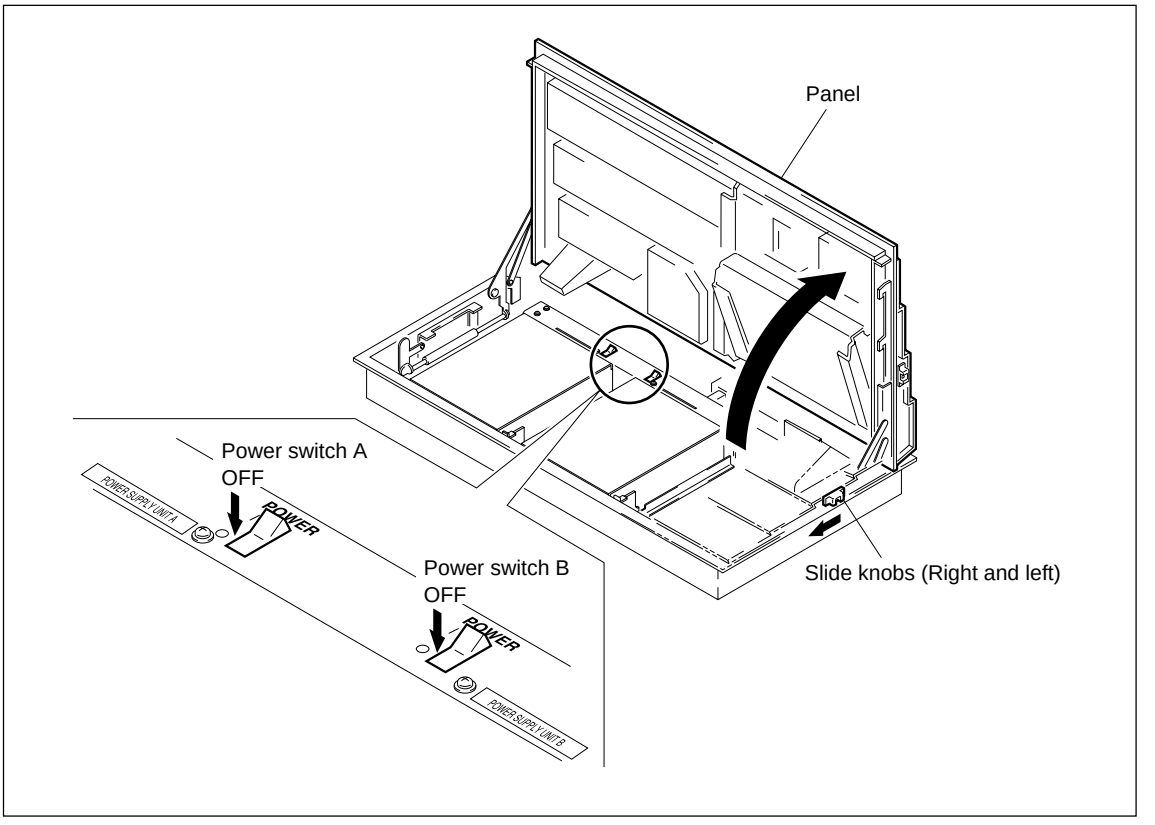
(1) Loosen the screws of the slide knobs at the both sides of the panel.
(2) Shift the slide knobs toward you and release the locks.
(3) Push up the panel and open it.




(4) Close the panel and push in the panel until the slide knobs are locked.
(5) Tighten the screws of the slide knobs at the both sides of the panel.

## 2-2. Turning on/off the Power Switch

(1) Open the panel. (Refer to Section 2-1.)
(2) Turn off the power switches A and B in the control panel.



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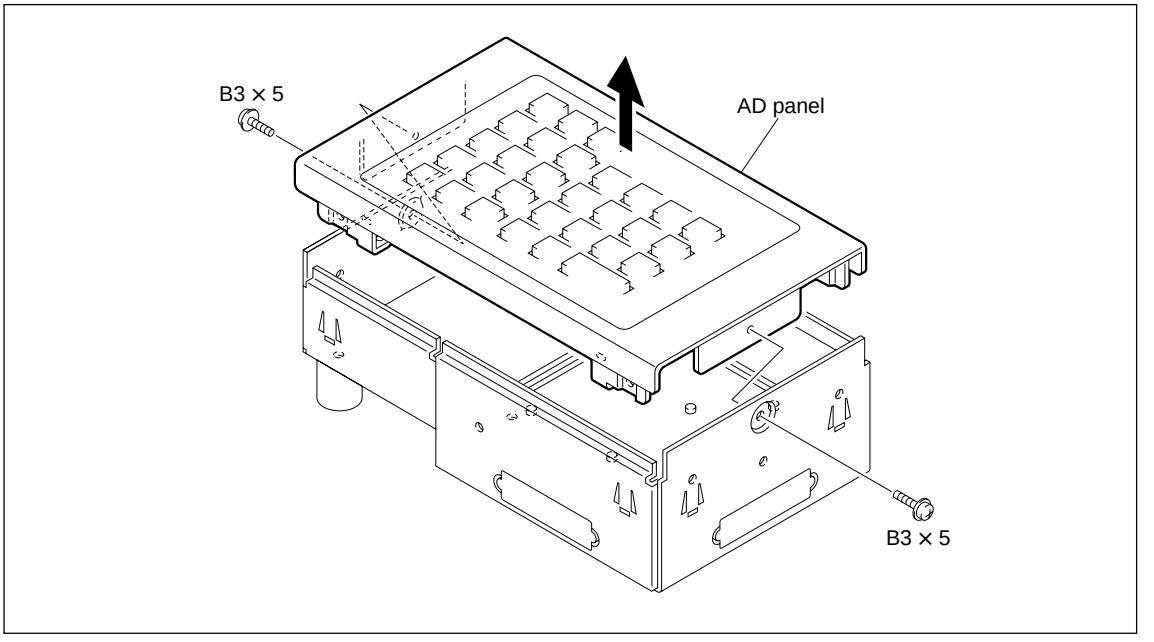
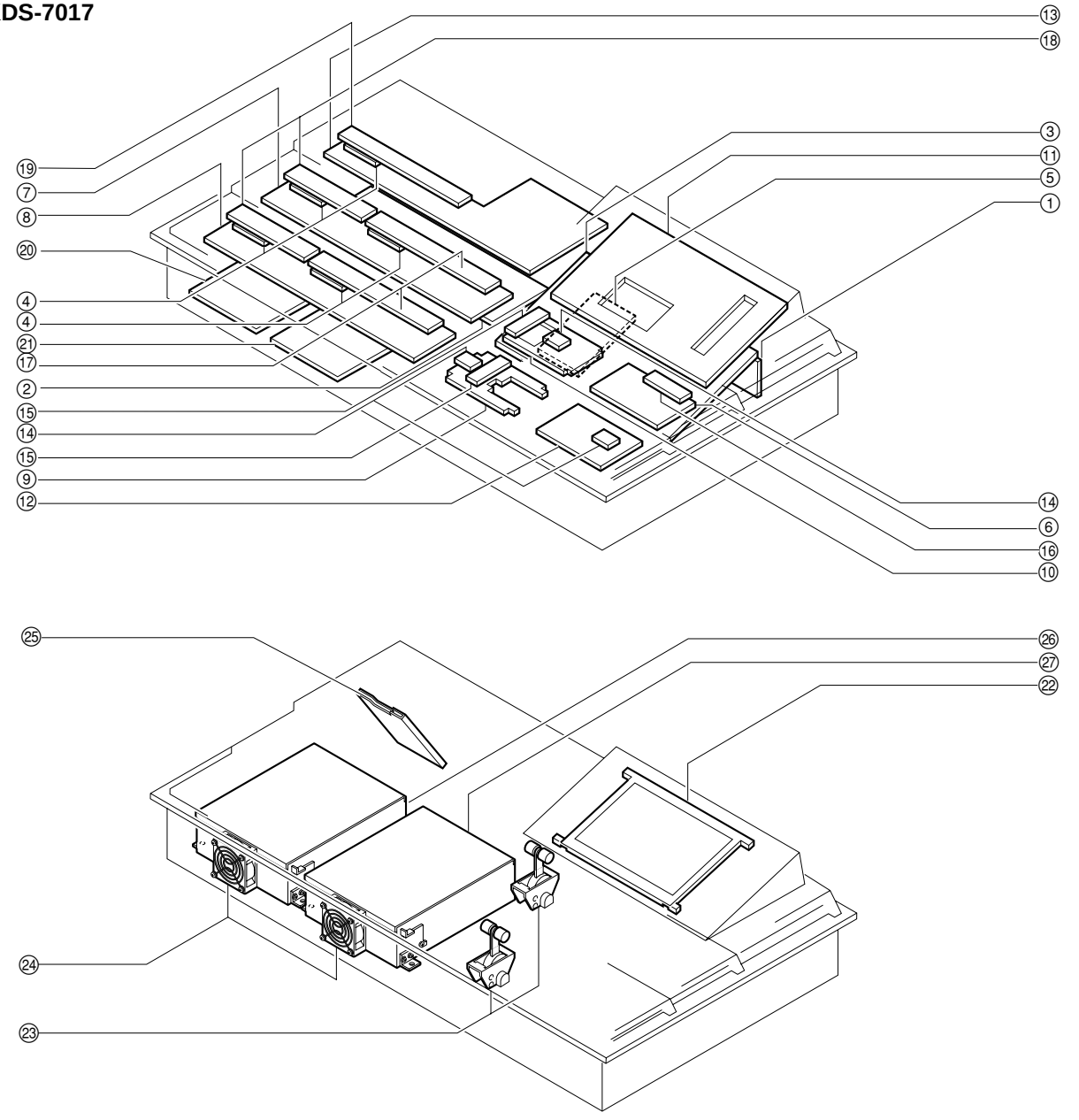
## 2-3. Removal of Adaptor Box (BKDS-7075)

(1) Remove the two screws shown below.
(2) Lift up the AD panel in the direction of the arrow and remove it.



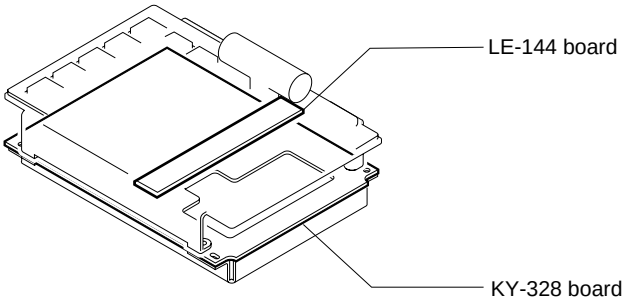
# 2-4. Location of Main Parts

**BKDS-7017**

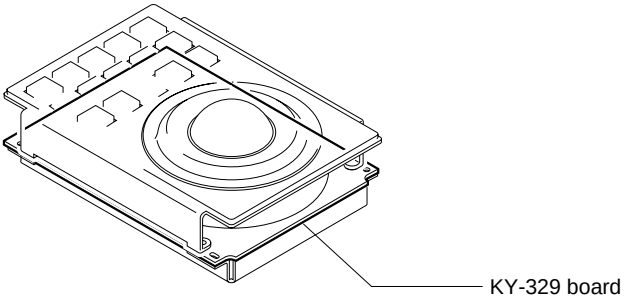



① CN-1149 board
② CN-1150 board
③ CPU-246 board
④ DC-92 board (BKDS-7003)
⑤ IF-523 board (BKDS-7001)
⑥ KY-324 board
⑦ KY-389A board
⑧ KY-389B board
⑨ KY-391 board
⑩ KY-392 board
⑪ KY-394 board
⑫ KY-440 board
⑬ KY-441 board
⑭ LE-142 board
⑮ LE-144 board
⑯ LE-146 board
⑰ LE-147 board (BKDS-7003)
⑱ LE-148 board (BKDS-7003)
⑲ LE-180 board (BKDS-7003)
⑳ RE-146 board
㉑ RE-146 board (BKDS-7091)
㉒ EL display
㉓ Fader assembly
㉔ Fan
㉕ FDD (Floppy disk drive) unit
㉖ Power unit
㉗ Redundant power unit (BKDS-7091)

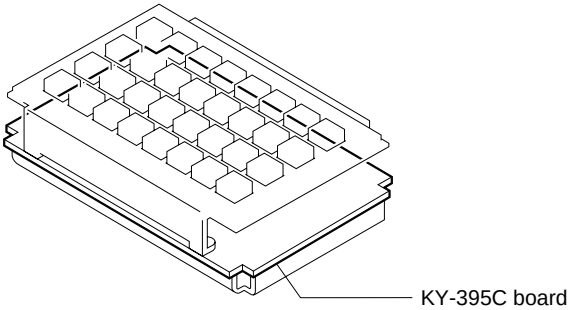
**BKDS-7030**



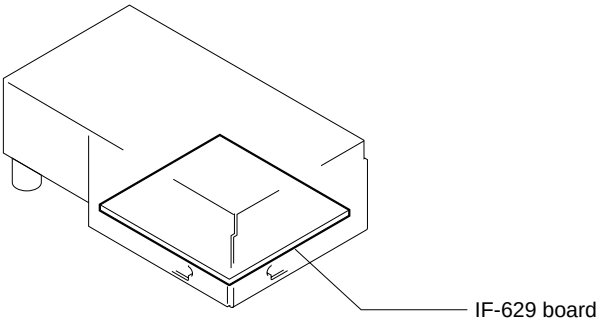

**BKDS-7031**




**BKDS-7033**




**BKDS-7075**



# 2-5. Replacement of Main Parts

## 2-5-1. Replacement of the Boards

**CAUTION**

To avoid shock hazards and/or damage to the boards, be sure to turn off the breaker at the outside of the control panel or unplug the power cord before installing and/or removing the boards.

### Order of describing the board replacement

1. CN-1149 Board
2. CN-1150 Board
3. IF-523 Board
4. CPU-246 Board
5. IF-629 Board
6. KY-389A/KY-389B Board
7. KY-391/KY-392 Board
8. KY-394 Board
9. KY-441 Board
10. KY-324/KY-440/KY-395C Board
11. KY-328 Board
12. KY-329 Board
13. LE-142 Board
14. LE-144 Board
15. LE-146 Board
16. LE-147/LE-148/LE-180 Board
17. DC-92 Board

---

### Removal of Retainers

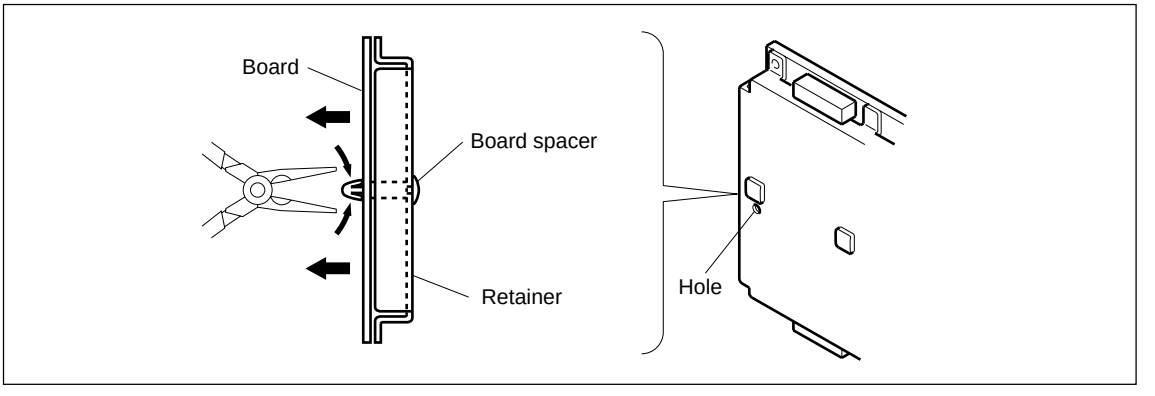
The retainers are installed to the following boards.

- KY-324/KY-328/KY-329/KY-389A/KY-389B/KY-391/KY-392/KY-394/KY-395C/KY-440/KY-441 Board

(1) Remove the board with the retainer.
(2) Pinch the board spacers on the board using a pair of radio pincers. Pull out the board while releasing the lock.

**Note**

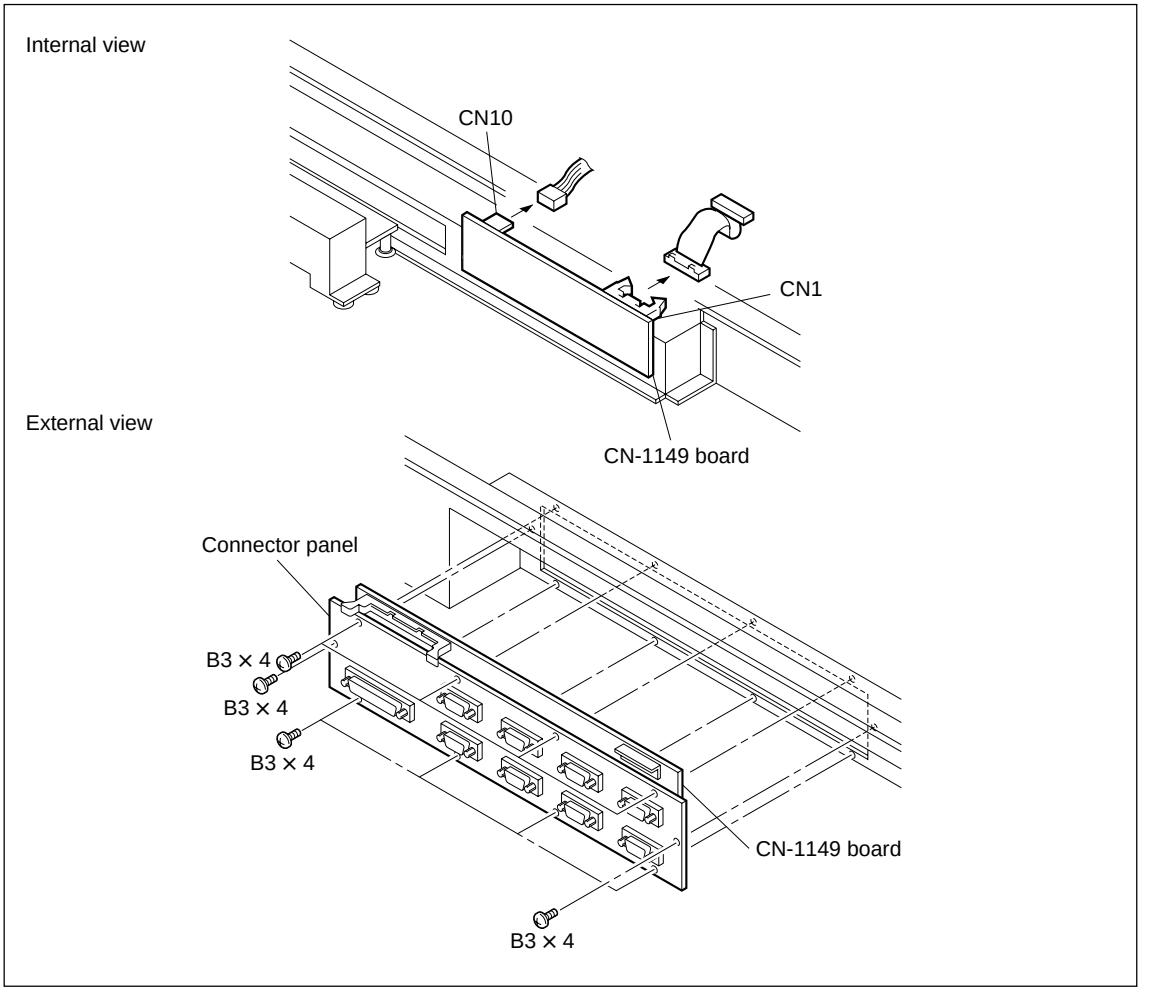
The board spacers that are necessary to release the lock have a small hole on the side of the spacer on the retainer as a guide.



## Installation and Removal of Boards

### 1. CN-1149 Board

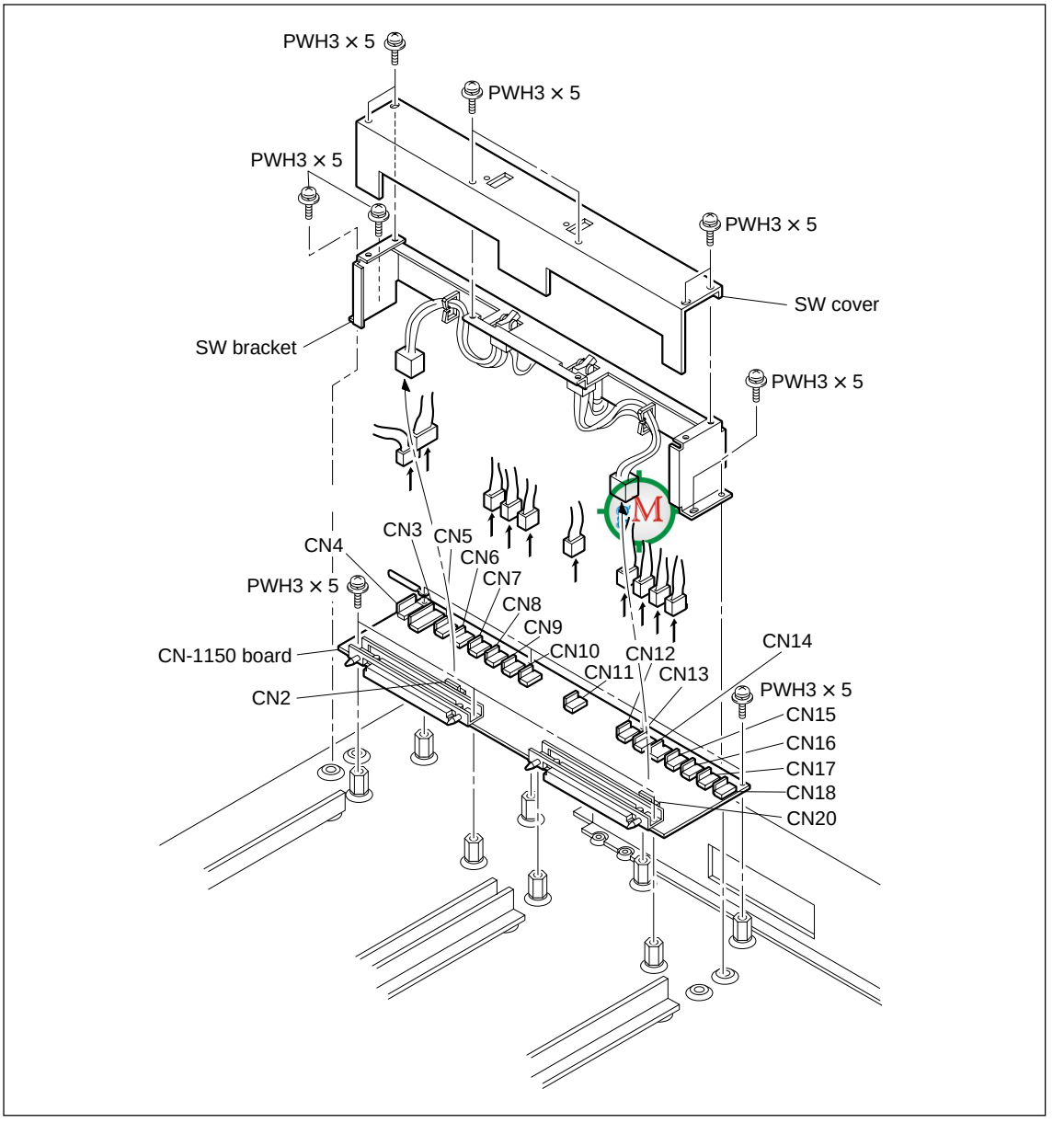
(1) Open the panel. (Refer to Section 2-1.)
(2) Turn off the power switch in the control panel. (Refer to Section 2-2.)
(3) Disconnect the two connectors (CN1 and CN10).
(4) Remove the 10 screws on the connector panel.
(5) Remove the CN-1149 board with the connector panel.




(6) Install a new CN-1149 board by reversing the disassembly procedure of steps (1) through (5).

## 2. CN-1150 Board

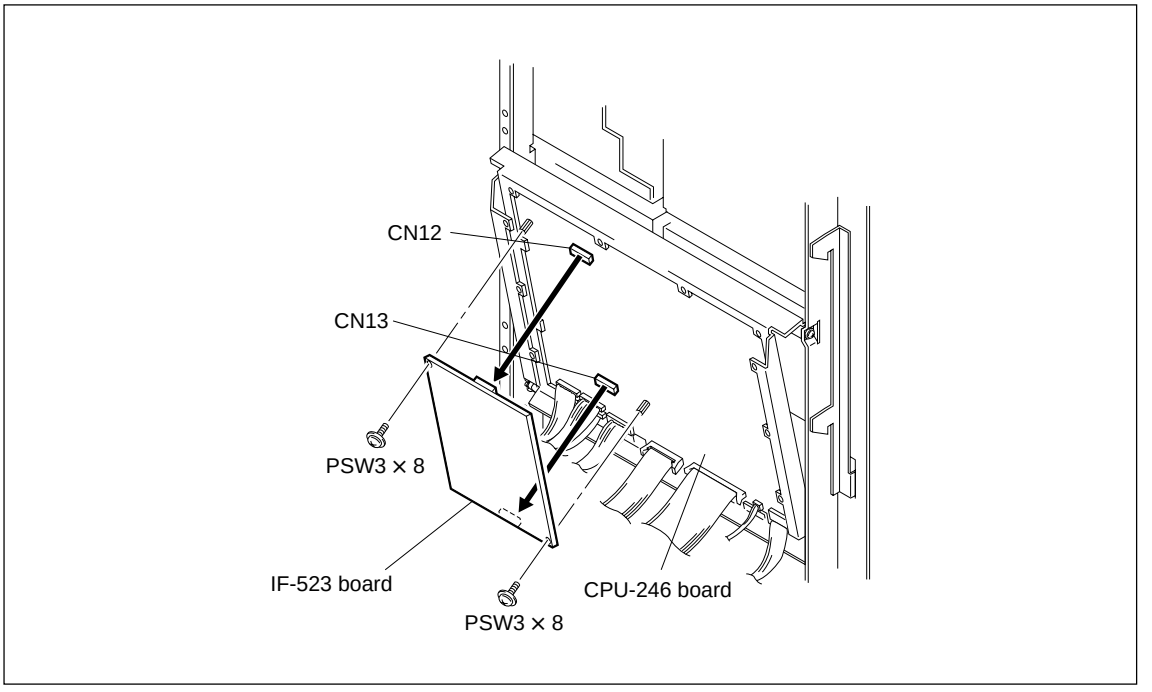
(1) Open the panel. (Refer to Section 2-1.)
(2) Turn off the power switch in the control panel. (Refer to Section 2-2.)
(3) Remove the six screws and the SW cover.
(4) Remove the four screws and disconnect the two connectors (CN2 and CN20), and then remove the SW bracket.
(5) Disconnect the 10 connectors (CN3, CN4, and CN8 through CN15).
(6) Remove the eight screws on the CN-1150 board.




(7) Install a new CN-1150 board by reversing the disassembly procedure of steps (1) through (6).

### 3. IF-523 Board

(1) Open the panel. (Refer to Section 2-1.)
(2) Turn off the power switch in the control panel. (Refer to Section 2-2.)
(3) Remove the four screws and remove the shield plate (CPU2).
(4) Remove the two screws and disconnect the IF-523 board from the connectors (CN12 and CN13) on the CPU-246 board.




(5) Install a new IF-523 board by reversing the disassembly procedure of steps (1) through (4).

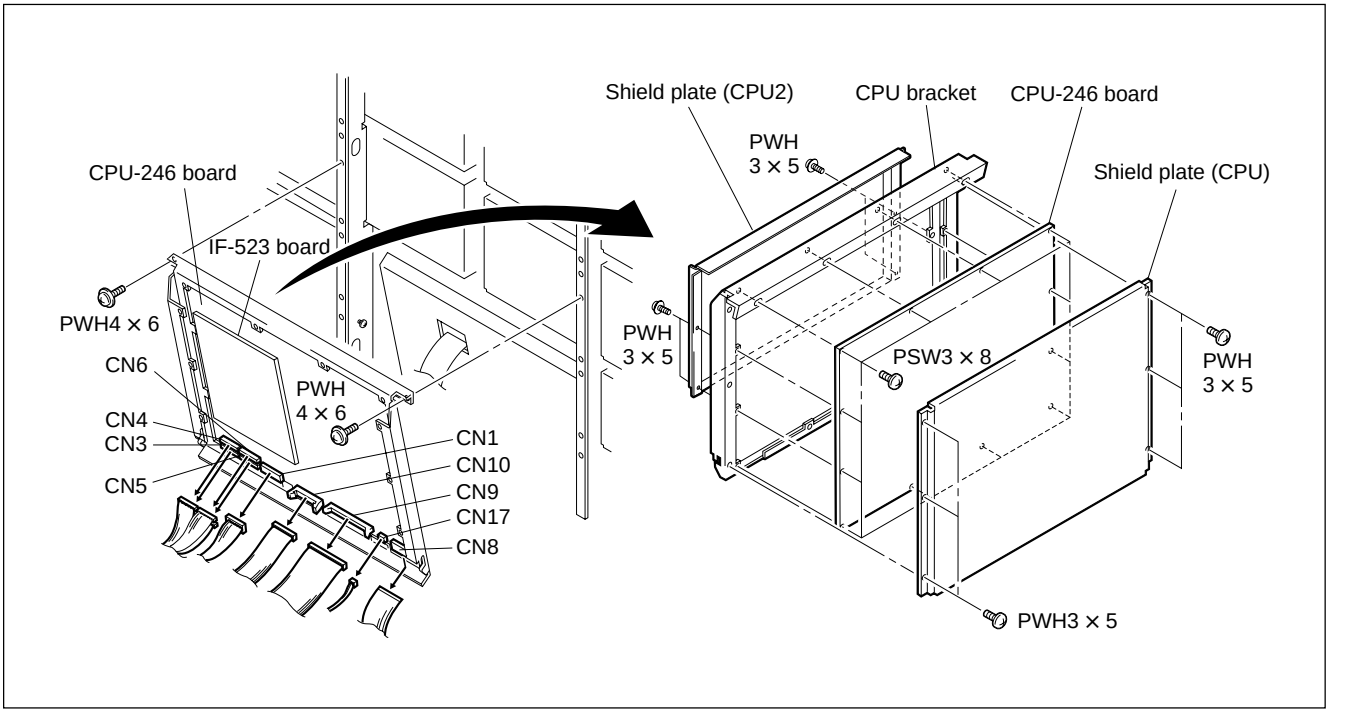
### 4. CPU-246 Board

(1) Open the panel. (Refer to Section 2-1.)
(2) Turn off the power switch in the control panel. (Refer to Section 2-2.)
(3) Remove the IF-523 board. (Refer to "3. IF-523 Board".)

**Note**

When Control Port Expansion Board BKDS-7001 is not installed, it is not necessary to perform the step (3).

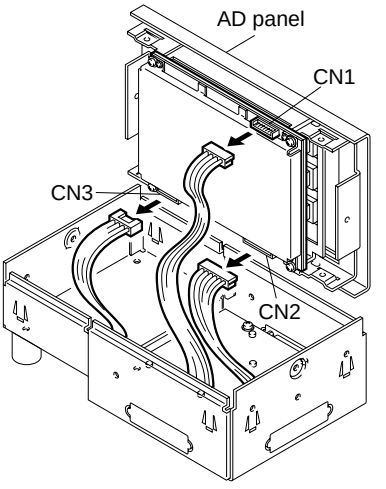
(4) Disconnect the eight connectors (CN1, CN3 through CN6, CN9, CN10, and CN17).
(5) Disconnect the flexible card wire (CN8).
(6) Remove the two screws.
(7) Remove the eighteen screws and remove the shield plate (CPU), the shield plate (CPU2), and the CPU bracket.



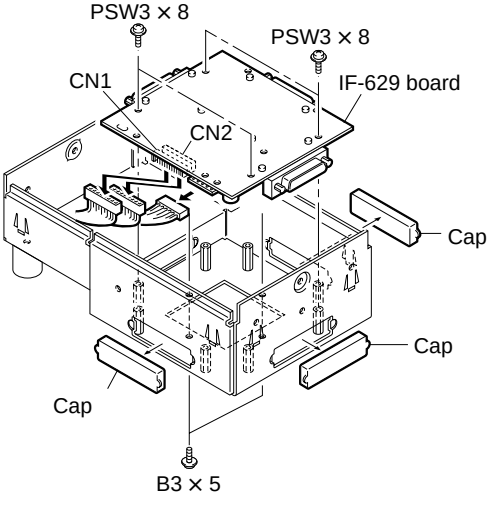

(8) Install a new CPU-246 board by reversing the disassembly procedure of steps (1) through (7).

### 5. IF-629 Board

(1) Open the panel. (Refer to Section 2-1.)
(2) Turn off the power switch in the control panel. (Refer to Section 2-2.)
(3) Remove the two screws, and then remove the AD panel. (Refer to Section 2-3.)
(4) Disconnect the three connectors (CN1 through CN3).



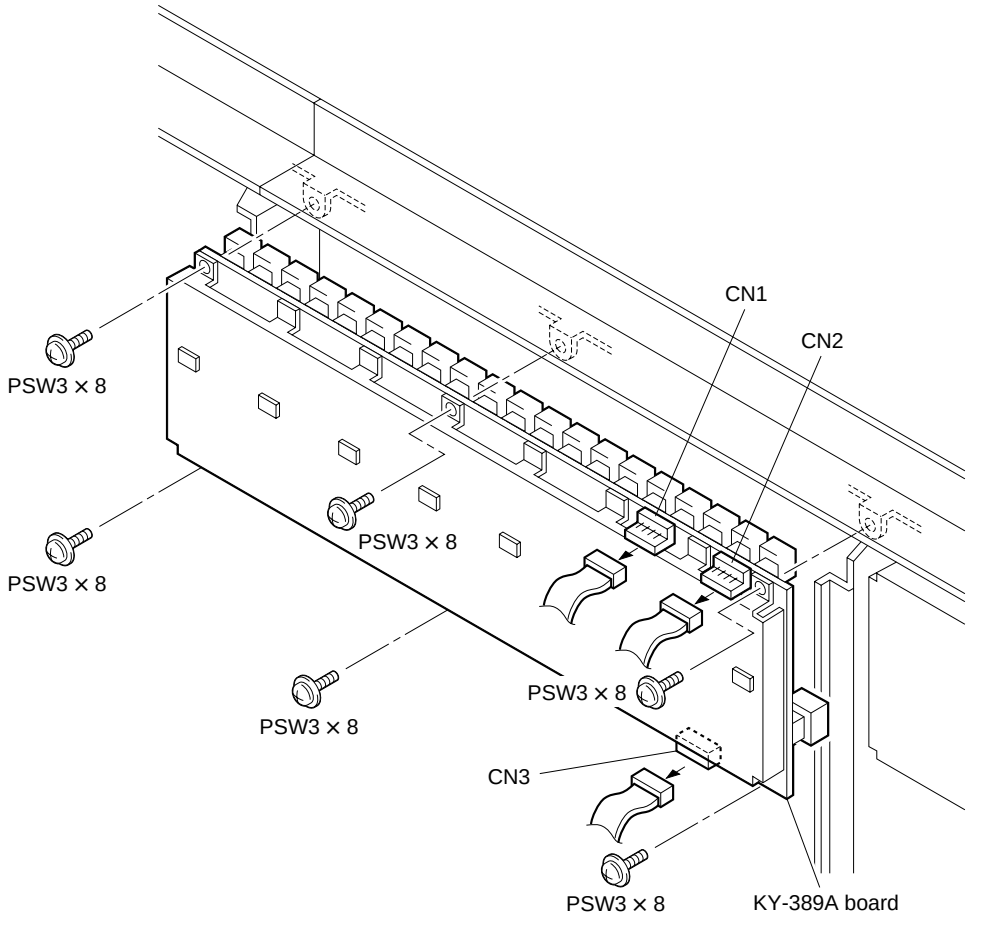

(5) Remove the three caps.
(6) Remove the six screws, and then remove the IF-629 board.
(7) Disconnect the three connectors (CN1 through CN3).




(8) Install a new IF-629 board by reversing the disassembly procedure of steps (1) through (7).

### 6. KY-389A/KY-389B Board

(1) Open the panel. (Refer to Section 2-1.)
(2) Turn off the power switch in the control panel. (Refer to Section 2-2.)
(3) Disconnect the three connectors (CN1 through CN3).
(4) Remove the six screws, and then remove the KY-389A or KY-389B board.
(5) Remove the LE-147, LE-148, or LE-180 board and the DC-92 board.
(Refer to “16. LE-147/LE-148/LE-180 Board” or “17. DC-92 Board”.)




**This illustration shows the KY-389A board.**

(6) Install a new KY-389A or KY-389B board by reversing the disassembly procedure of steps (1) through (5).

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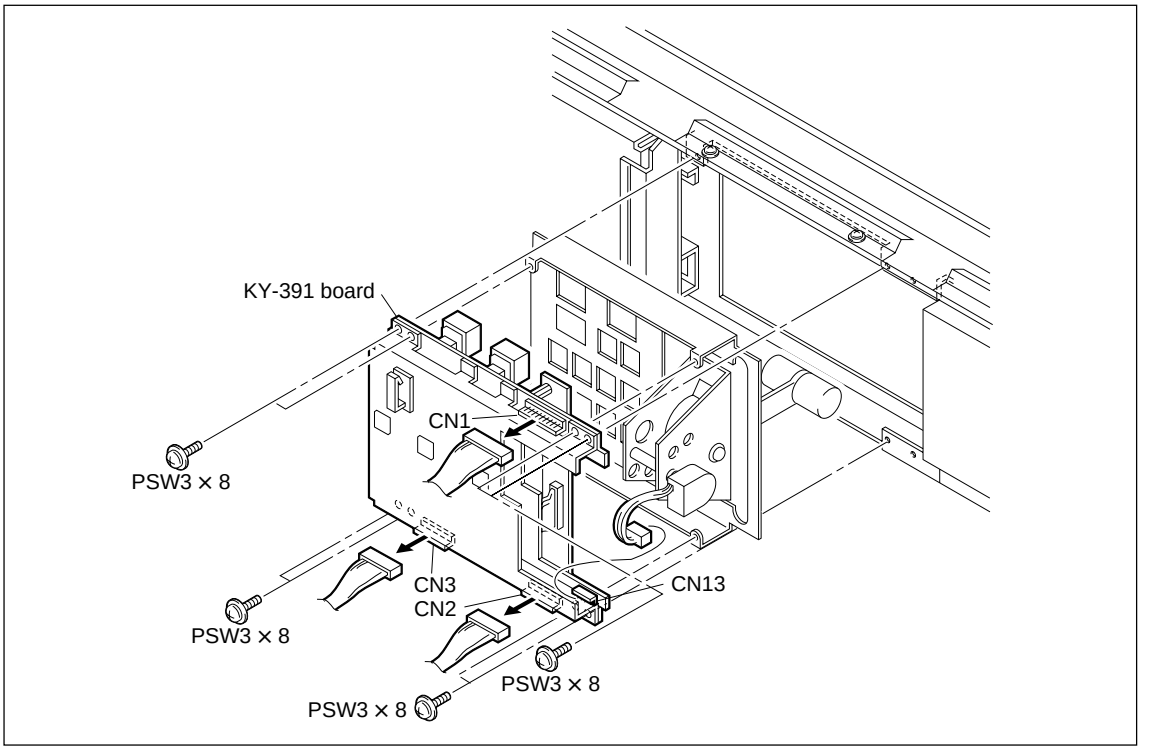
## 7. KY-391/KY-392 Board

(1) Open the panel. (Refer to Section 2-1.)
(2) Turn off the power switch in the control panel. (Refer to Section 2-2.)
(3) Remove the CPU-246 board. (Refer to “4. CPU-246 Board”.)

**Note**

When removing the KY-391 board, it is not necessary to perform the step (3).

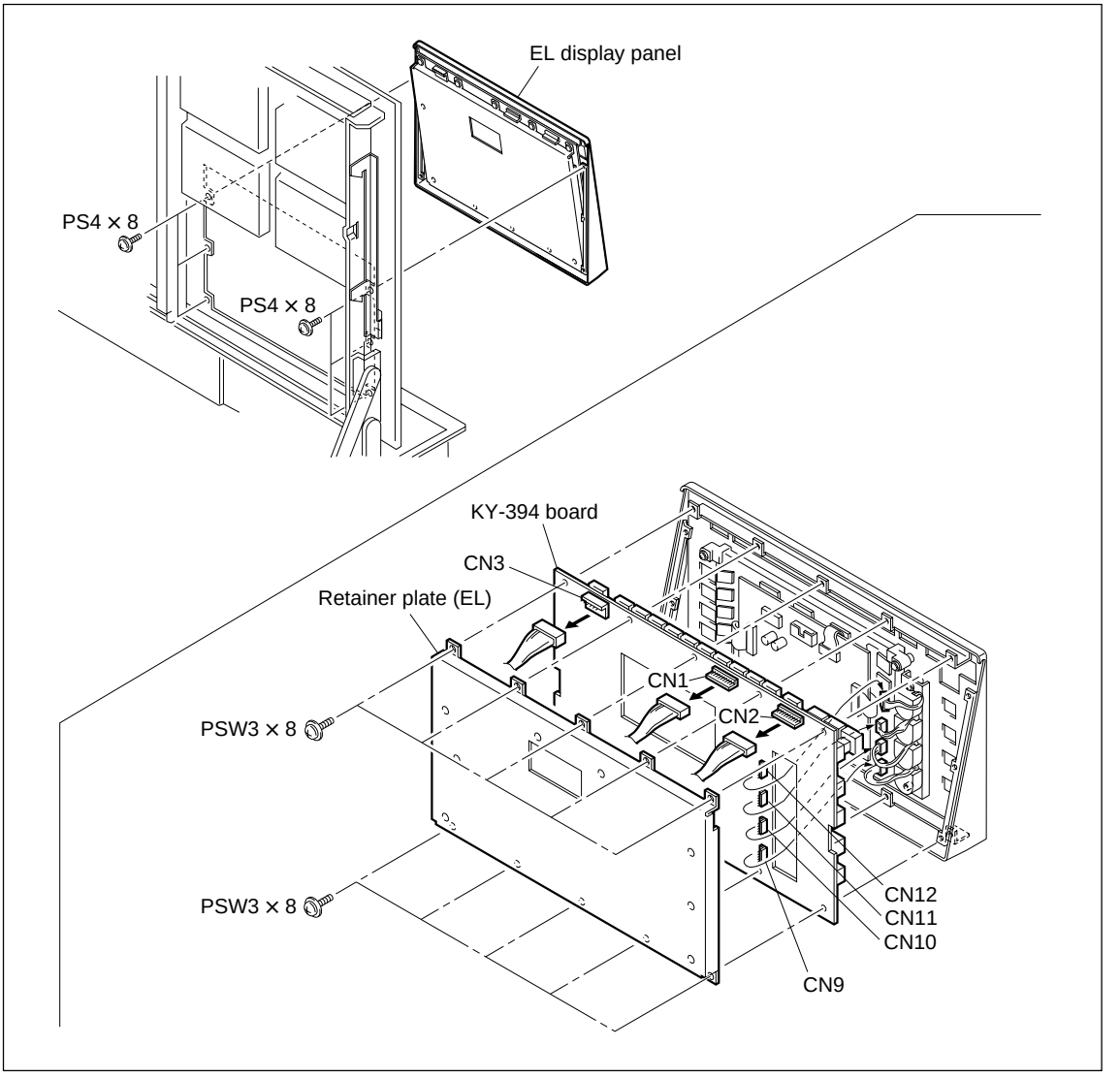
(4) Disconnect the four connectors (CN1 through CN3 and CN13).
(5) Remove the eight screws, and then remove the KY-391 or KY-392 board.
(6) Remove the LE-142 board and the LE-144 board.
(Refer to “13. LE-142 Board” or “14. LE-144 Board” .)




(7) Install a new KY-391 or KY-392 board by reversing the disassembly procedre of steps (1) through (6).

### 8. KY-394 Board

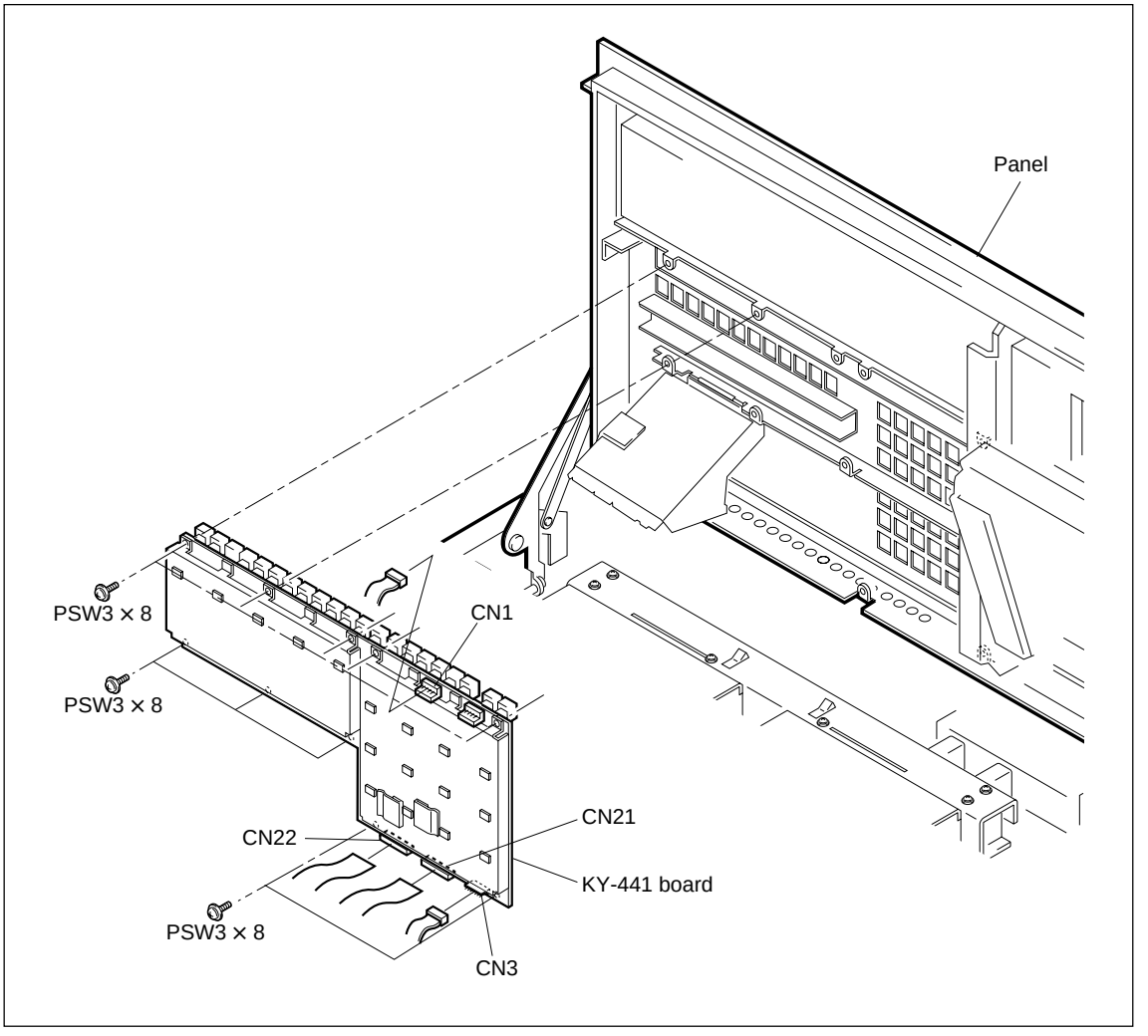
(1) Open the panel. (Refer to Section 2-1.)
(2) Turn off the power switch in the control panel. (Refer to Section 2-2.)
(3) Remove the CPU-246 board. (Refer to “4. CPU-246 Board”.)
(4) Remove the six screws securing the EL display panel.
(5) Disconnect the three connectors (CN1 through CN3).
(6) Remove the 10 screws on the retainer plate (EL).
(7) Disconnect the four connectors (CN9 through CN12) and remove the KY-394 board.




(8) Install a new KY-394 board by reversing the disassembly procedure of steps (1) through (7).

### 9. KY-441 Board

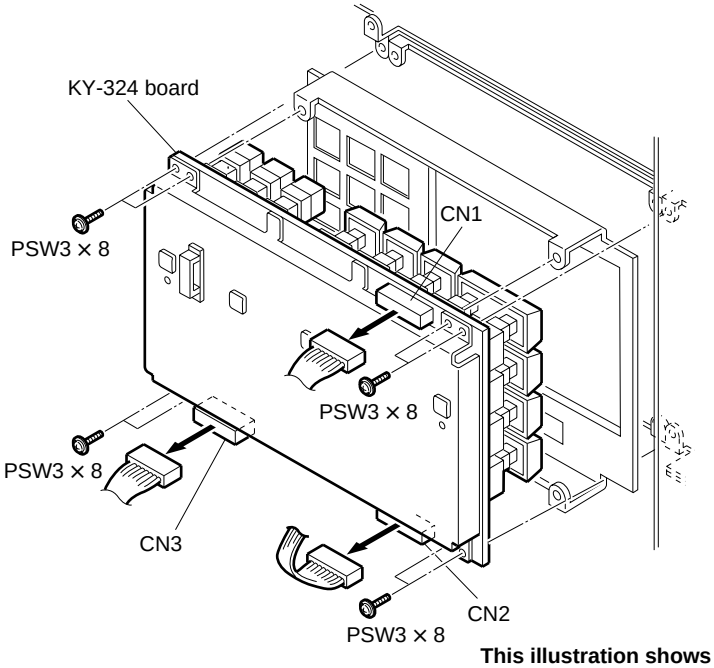
(1) Open the panel. (Refer to Section 2-1.)
(2) Turn off the power switch in the control panel. (Refer to Section 2-2.)
(3) Disconnect the connectors (CN1, CN3, CN21, and CN22) of the KY-441 board.
(4) Remove the ten screws, and then remove the KY-441 board.




(5) Install a new KY-441 board by reversing the disassembly procedure of steps (1) through (4).

## 10. KY-324/KY-440/KY-395C Board

(1) Open the panel. (Refer to Section 2-1.)
(2) Turn off the power switch in the control panel. (Refer to Section 2-2.)
(3) When removing the board installed in the adaptor box (BKDS-7075), remove the two screws then remove the AD panel. (Refer to Section 2-3.)
(4) Disconnect the connectors.
For KY-324 board : CN1 through CN3
For KY-440 board : CN1 through CN3
For KY-395C board : CN1 through CN3
(5) Remove the eight screws, and then remove the KY-324, KY-440, or KY-395C board.

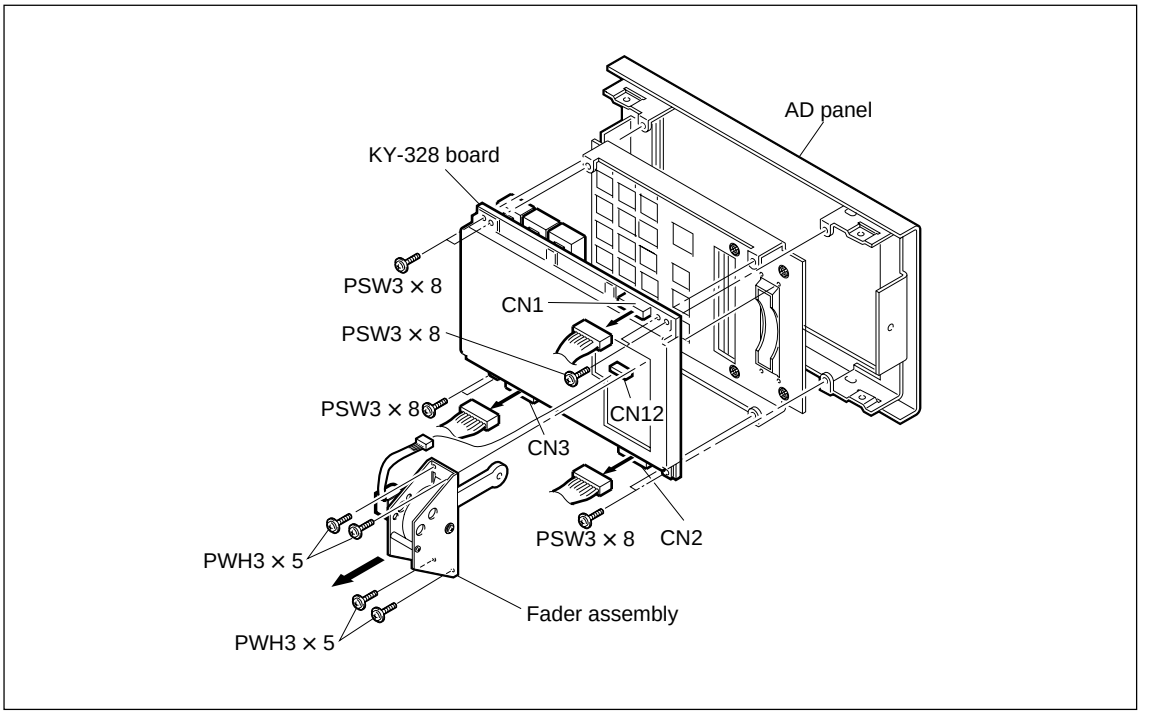



**This illustration shows the KY-324 board.**

(6) Install a new KY-324, KY-440, or KY-395C board by reversing the disassembly procedure of steps (1) through (5).

### 11. KY-328 Board

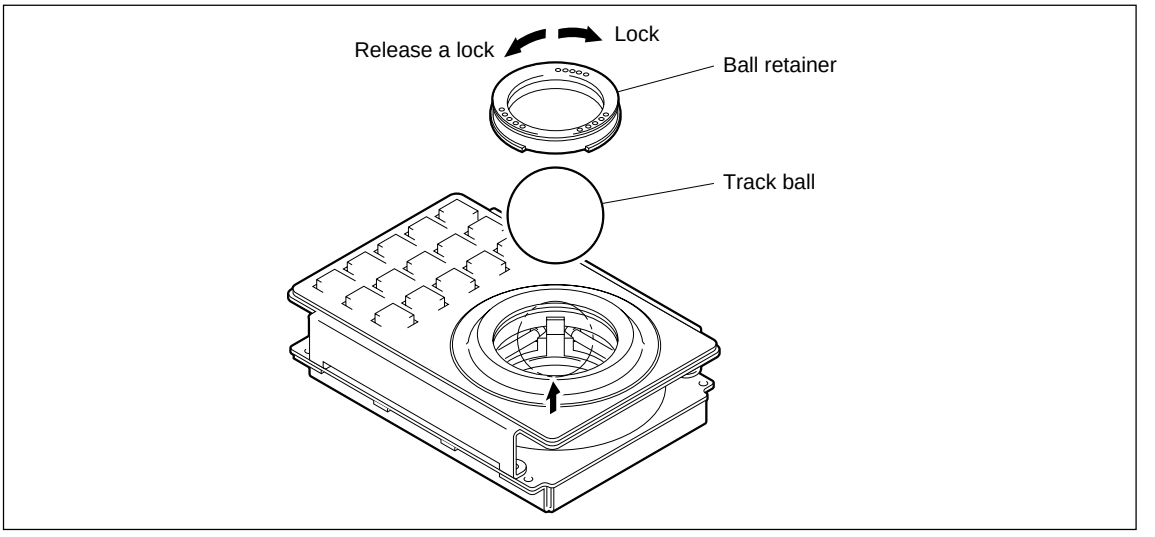
(1) Open the panel. (Refer to Section 2-1.)
(2) Turn off the power switch in the control panel. (Refer to Section 2-2.)
(3) Remove the CPU-246 board. (Refer to "4. CPU-246 Board".)
(4) Remove the two screws from the adaptor box (BKDS-7075), and remove the AD panel. (Refer to Section 2-3.)
(5) Disconnect the four connectors (CN1 through CN3 and CN12).
(6) Remove the fader assembly. (Refer to Section 2-5-4.)
(7) Remove the eight screws, and then remove the KY-328 board.



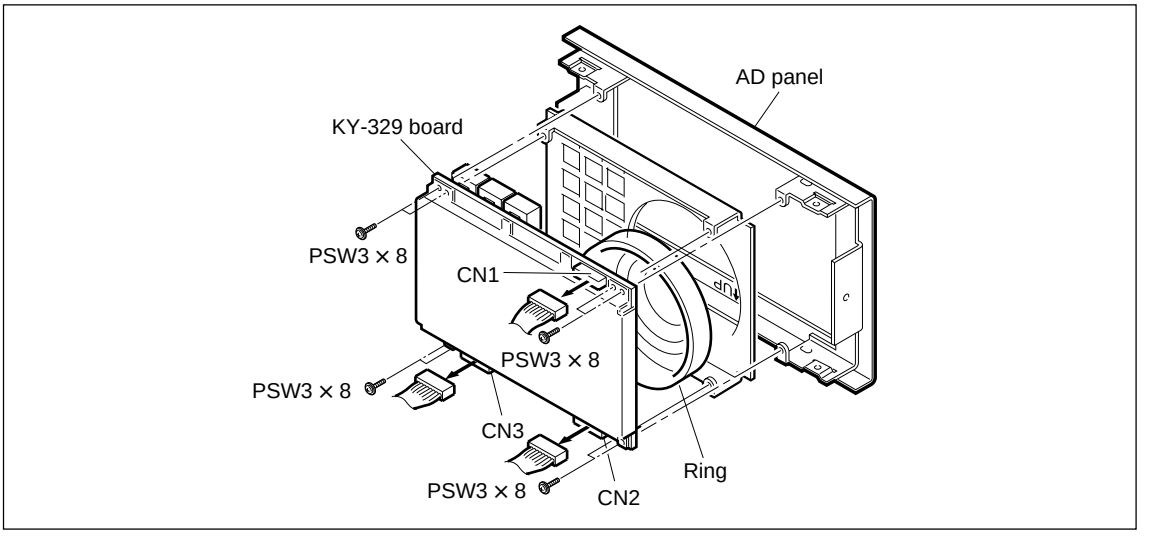

(8) Install a new KY-328 board by reversing the disassembly procedure of steps (1) through (7).

## 12. KY-329 Board

(1) Open the panel. (Refer to Section 2-1.)
(2) Turn off the power switch in the control panel. (Refer to Section 2-2.)
(3) Remove the two screws from the adaptor box (BKDS-7075), and remove the AD panel. (Refer to Section 2-3.)
(4) Turn the ball retainer counterclockwise to release a lock.
(5) Push up the track ball from the hole on the KY-329 board and remove the track ball and ball retainer.



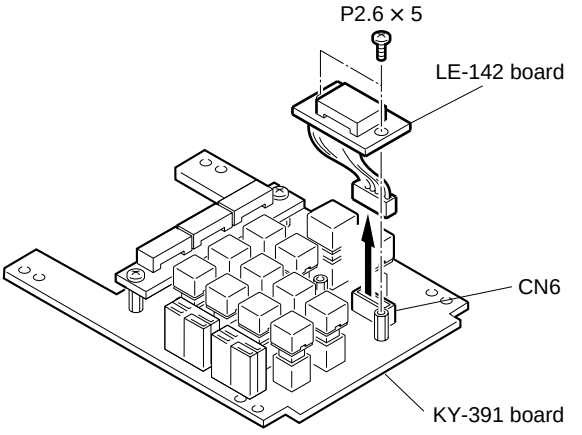

(6) Disconnect the three connectors (CN1 through CN3).
(7) Remove the eight screws, and then remove the KY-329 board.
(8) Remove the ring.




(9) Install a new KY-329 board by reversing the disassembly procedure of steps (1) through (8).

### 13. LE-142 Board

(1) Open the panel. (Refer to Section 2-1.)
(2) Turn off the power switch in the control panel. (Refer to Section 2-2.)
(3) When replacing the LE-142 board on the KY-392 board, remove the CPU-246 board.
(Refer to “4. CPU-246 Board”.)
(4) Remove the KY-391, KY-392, or KY-440 board.
(Refer to “7. KY-391/KY-392 Board” or “10. KY-324/KY-440/KY-395C Board”.)
(5) Remove the two screws securing the LE-142 board.
(6) Disconnect the following connector on the KY-391, KY-392, or KY-440 board and remove the LE-142 board.
For KY-391 or KY-392 board : CN6
For KY-440 board : CN10 or CN11



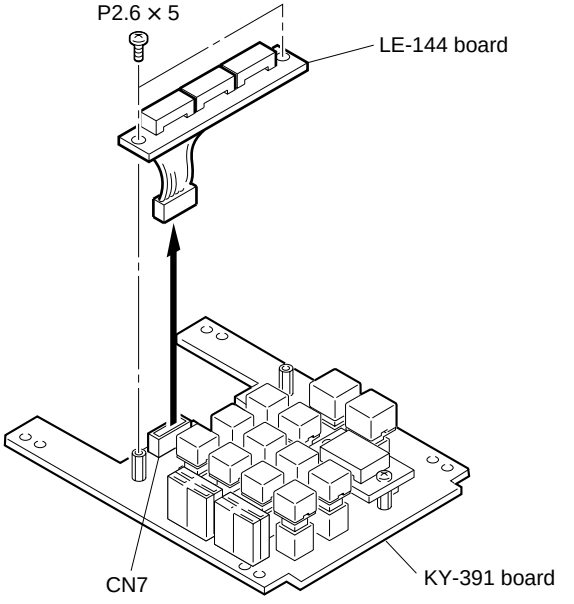

**This illustration shows the removal from the KY-391 board.**

(7) Install a new LE-142 board by reversing the disassembly procedure of steps (1) through (6).

## 14. LE-144 Board

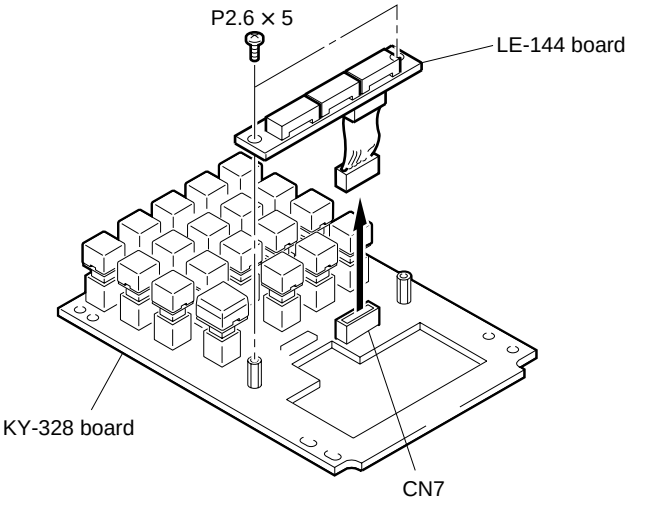
(1) Open the panel. (Refer to Section 2-1.)
(2) Turn off the power switch in the control panel. (Refer to Section 2-2.)
(3) When replacing the LE-144 board on the KY-328 board, remove the two screws on the adaptor box (BKDS-7075) and then remove the AD panel. (Refer to Section 2-3.)
When replacing the LE-144 board on the KY-392 board, remove the CPU-246 board. (Refer to "4. CPU-246 Board".)
(4) Remove the KY-328, KY-391, or KY-392 board. (Refer to "7. KY-391/KY-392 Board" or "11. KY-328 Board".)
(5) Remove the two screws on the LE-144 board.
(6) Disconnect the connector (CN7) and remove the LE-144 board.

**KY-391 or KY-392 board**




**This illustration shows the removal from the KY-391 board.**

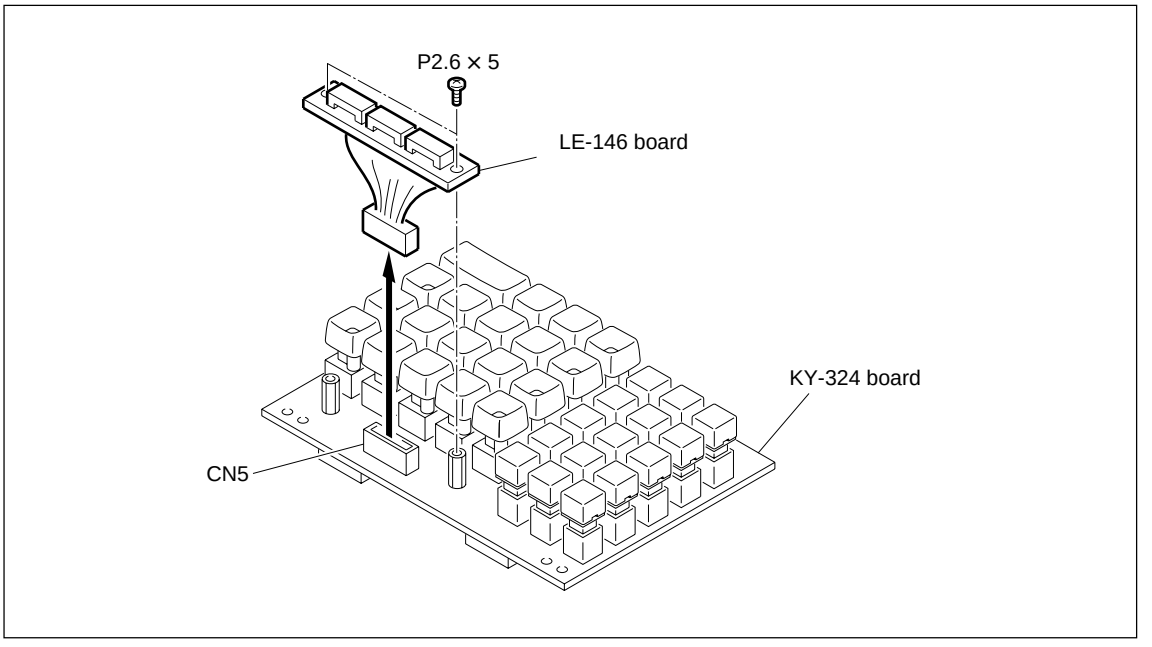
**KY-328 board**




(7) Install a new LE-144 board by reversing the disassembly procedure of steps (1) through (6).

### 15. LE-146 Board

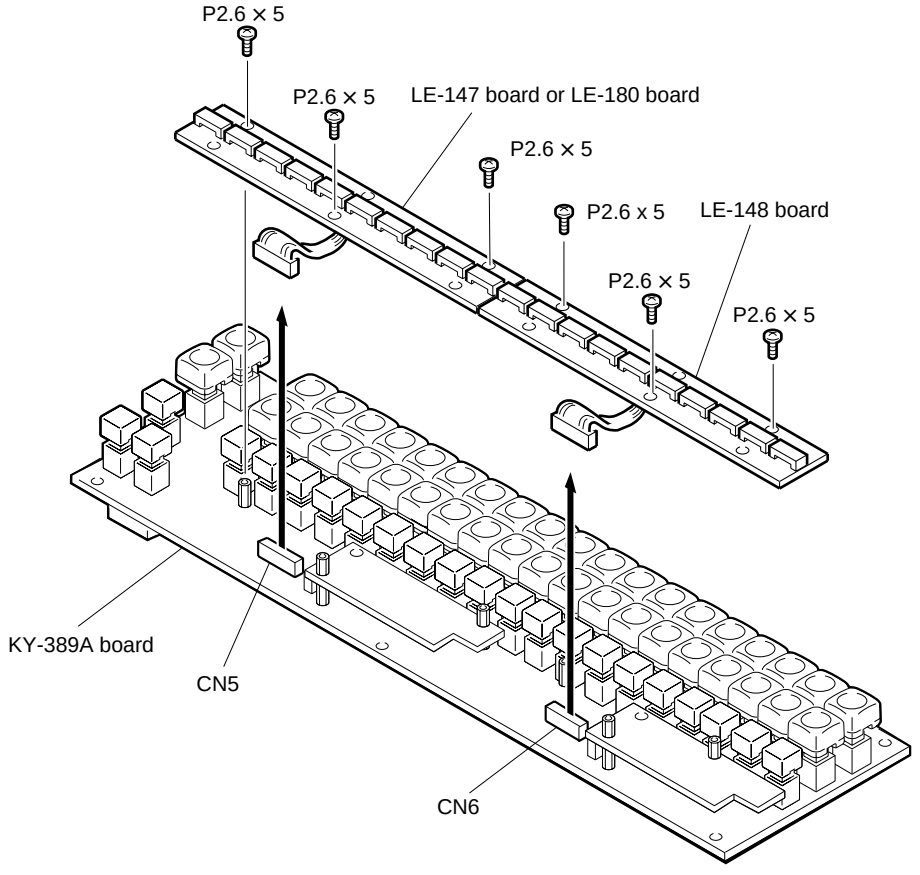
(1) Open the panel. (Refer to Section 2-1.)
(2) Turn off the power switch in the control panel. (Refer to Section 2-2.)
(3) Remove the KY-324 board. (Refer to “10. KY-324/KY-440/KY-395C Board”.)
(4) Remove the two screws securing the LE-146 board.
(5) Disconnect the connector (CN5) and remove the LE-146 board.




(6) Install a new LE-146 board by reversing the disassembly procedure of steps (1) through (5).

## 16. LE-147/LE-148/LE-180 Board

(1) Open the panel. (Refer to Section 2-1.)
(2) Turn off the power switch in the control panel. (Refer to Section 2-2.)
(3) Remove the KY-389A, KY-389B, or KY-441 board.
(Refer to “6. KY-389A/KY-389B Board” or “9. KY-441 Board”.)
(4) Remove the three screws securing the LE-147, LE-148, or LE-180 board.
(5) Disconnect the following connector on the KY-389A, KY-389B, or KY-441 board and remove the LE-147, LE-148, or LE-180 board.
For LE-147 or LE-180 board : CN5 on the KY-389A, KY-389B, or KY-441 board
For LE-148 board : CN6 on the KY-389A, KY-389B, or KY-441 board




**This illustration shows the removal from the KY-389A board.**

(6) Install a new LE-147, LE-148, or LE-180 board by reversing the disassembly procedure of steps (1) through (5).

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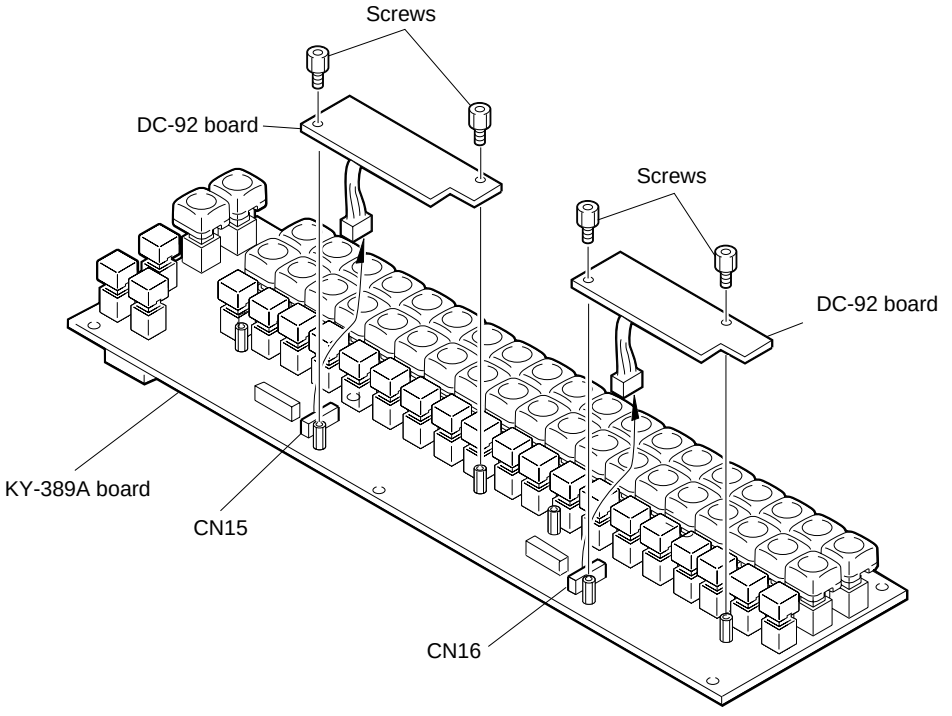
## 17. DC-92 Board

(1) Open the panel. (Refer to Section 2-1.)
(2) Turn off the power switch in the control panel. (Refer to Section 2-2.)
(3) Remove the KY-389A, KY-389B, or KY-441 board.
(Refer to “6. KY-389A/KY-389B Board” or “9. KY-441 Board”.)
(4) Remove the LE-147, LE-148, or LE-180 board. (Refer to “16. LE-147/LE-148/LE-180 Board”.)
(5) Remove the two screws securing the LE-147, LE-148, or LE-180 board.
(6) Disconnect the one connector (CN15 or CN16) on the KY-389A, KY-389B, or KY-441 board and remove the DC-92 board.




**This illustration shows the removal from the KY-389A board.**

(7) Install a new DC-92 board by reversing the disassembly procedure of steps (1) through (6).

## 2-5-2. Replacement of Backup Memory IC

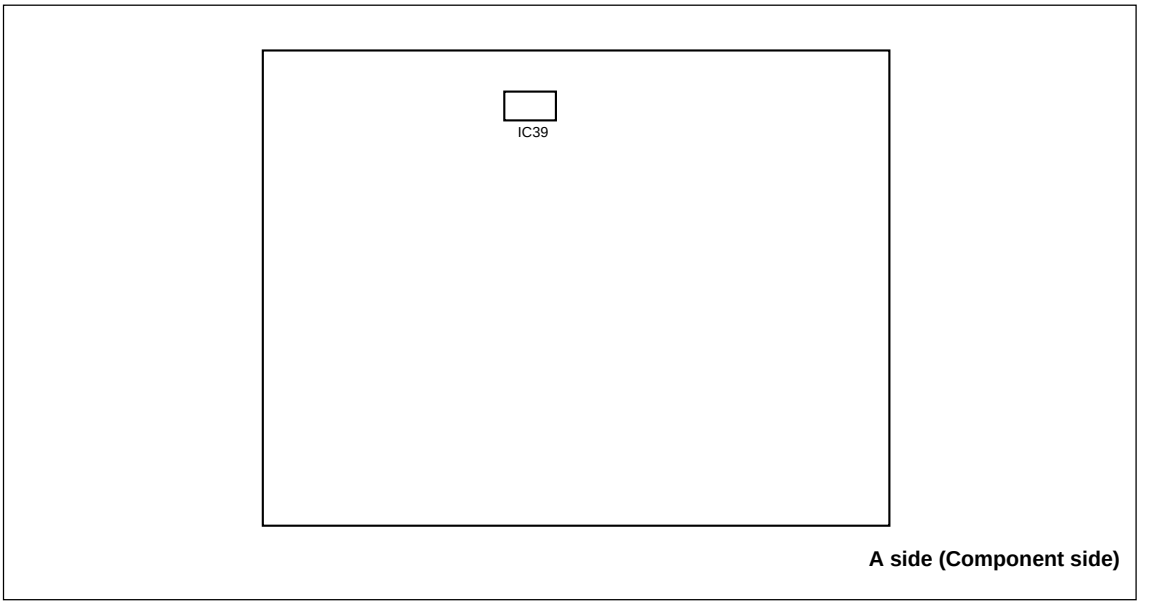
In the memory check at power-on, if an error is detected in a backup memory IC on the CPU-246 board, replace the IC. When replacing the IC, be sure to use the following IC.

### Replacement Part

CPU-246 Board (IC39)
Description : M48Z30Y-100PM1 (C-MOS 256K-BIT NON-VOLATILE STATIC RAM)
Part number : 8-749-011-87

### Replacement Procedures

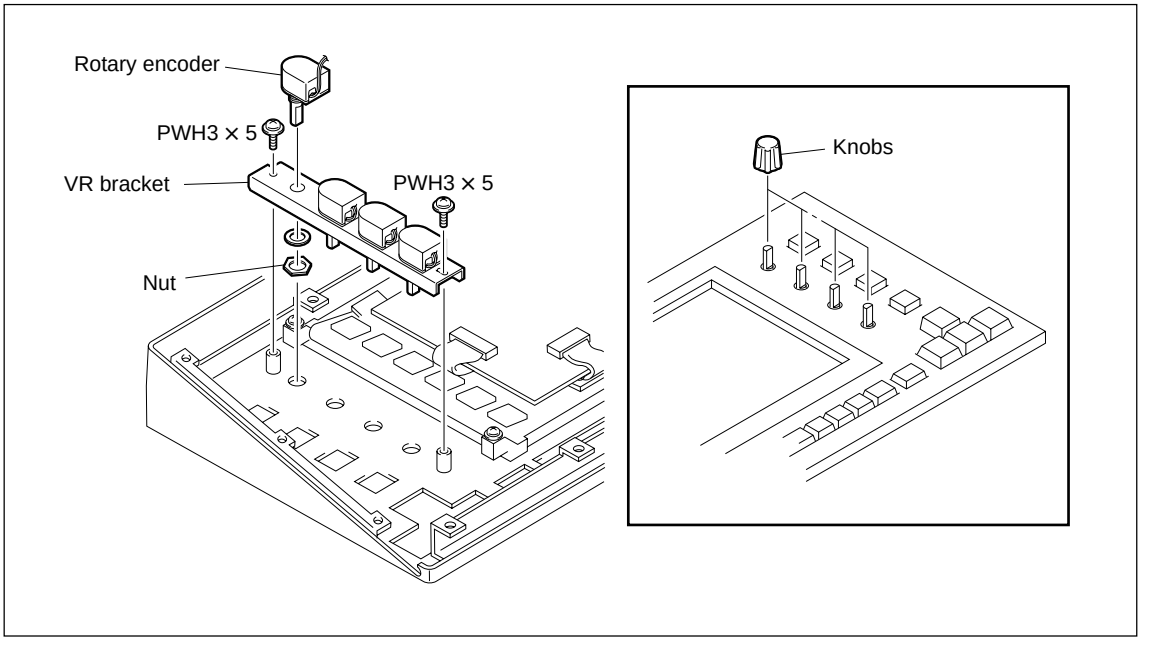
(1) Open the panel. (Refer to Section 2-1.)
(2) Turn off the power switch in the control panel. (Refer to Section 2-2.)
(3) Remove the IC39 on the CPU-246 board from the IC socket.




(4) Install a new IC by reversing the disassembly procedure of steps (1) through (3).

## 2-5-3. Replacement of Rotary Encoder

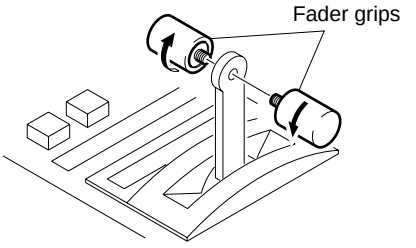
(1) Remove the four knobs.
(2) Open the panel. (Refer to Section 2-1.)
(3) Turn off the power switch in the control panel. (Refer to Section 2-2.)
(4) Remove the KY-394 board. (Refer to Section 2-5-1 “8. KY-394 Board”.)
(5) Remove the two screws on the VR bracket.
(6) Remove the connector (one of CN9 through CN12 on the KY-394 board) connected to the rotary encoder to be replaced.
(7) Remove the nut of the rotary encoder to be replaced.




(8) Install a new rotary encoder by reversing the disassembly procedure of steps (1) through (7).

## 2-5-4. Replacement of Fader Assembly

(1) Turn the fader grip of the fader assembly to be replaced in the direction of the arrow and remove the fader grip.

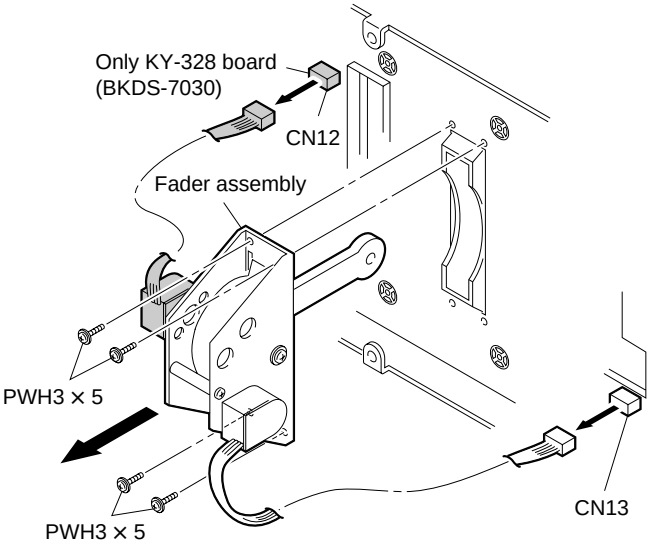



(2) Open the panel. (Refer to Section 2-1.)
(3) Turn off the power switch in the control panel. (Refer to Section 2-2.)
(4) When removing the fader assembly (BKDS-7030) in the adaptor box (BKDS-7075), remove the two screws and then remove the AD panel. (Refer to Section 2-3.)
When removing the fader assembly in the control panel (BKDS-7017), remove the CPU-246 board. (Refer to Section 2-5-1 “4. CPU-246 Board” .)

**Note**

When removing the fader assembly on the KY-391 board, it is not necessary to perform the step (4).

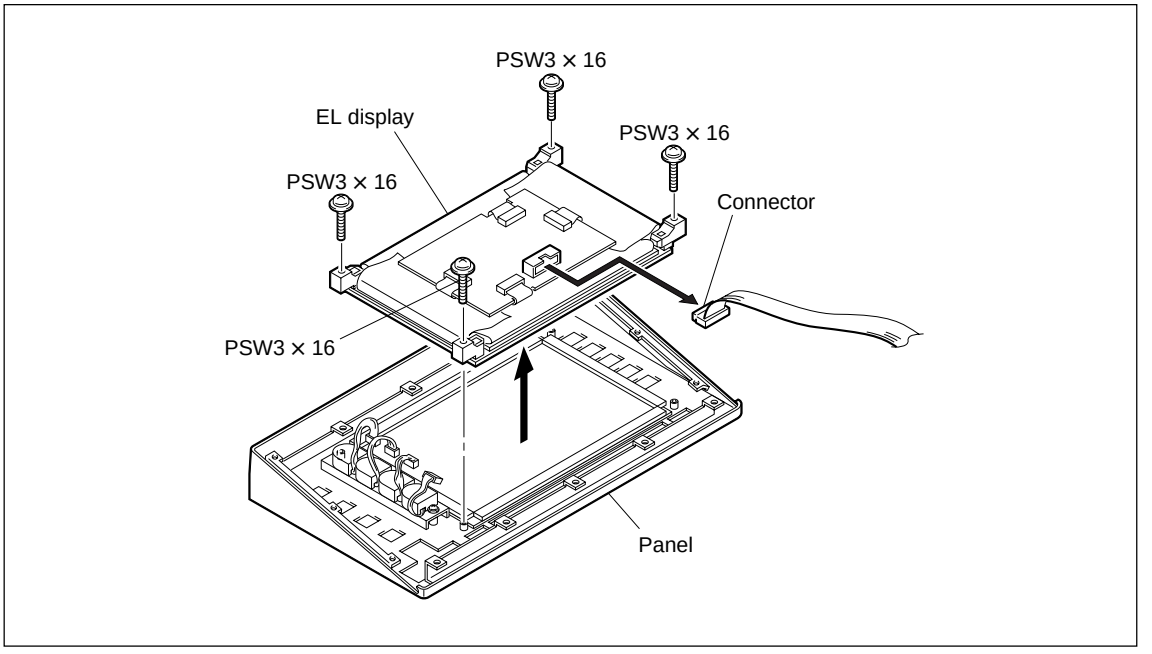
(5) Disconnect the connector.
For KY-391, KY-392, or KY-441 board : CN13
For KY-328 board : CN12
(6) Remove the four screws securing the fader assembly to be replaced.




(7) Install a new fader assembly by reversing the disassembly procedure of steps (1) through (6).

## 2-5-5. Replacement of EL Display

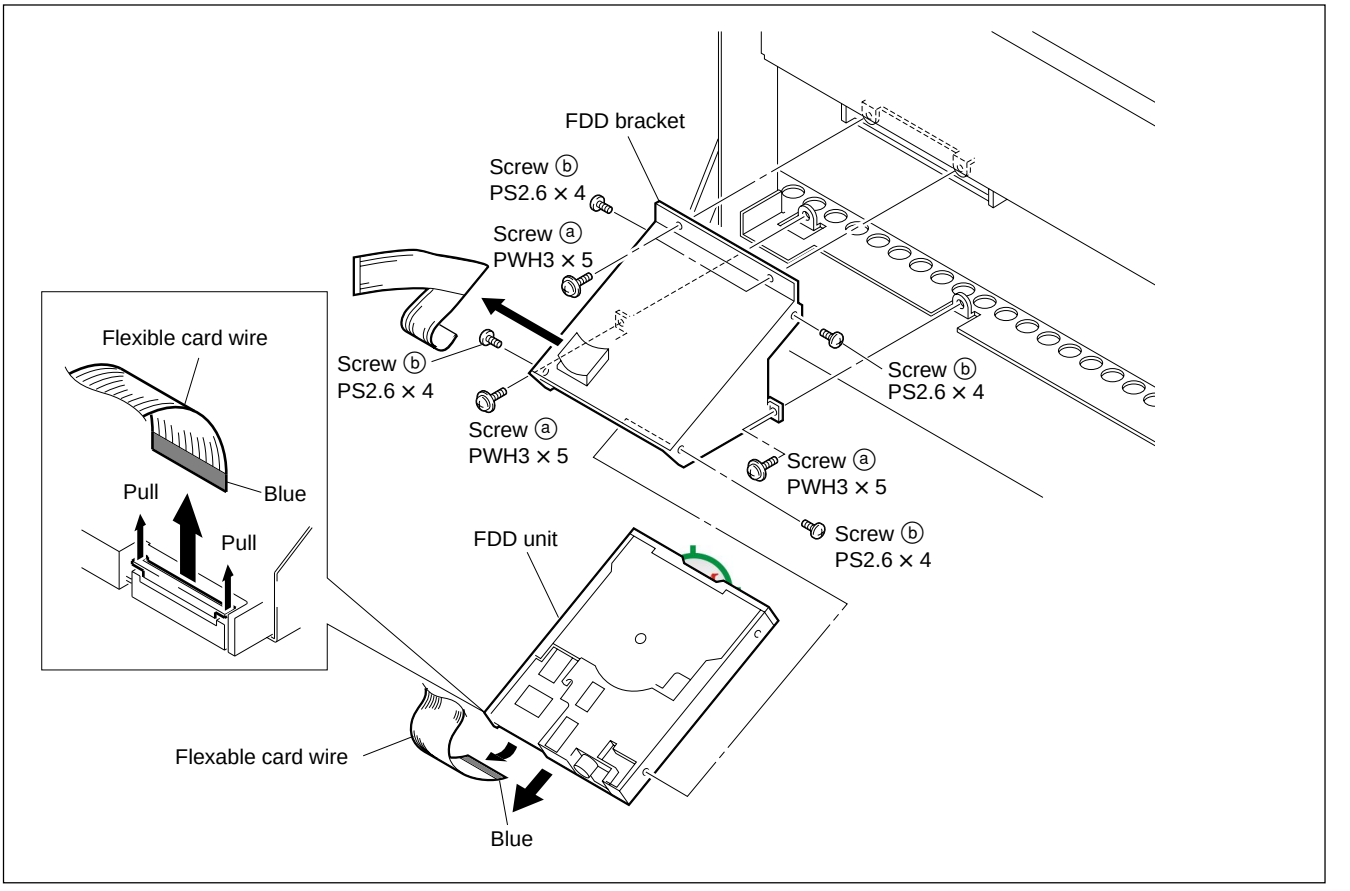
(1) Open the panel. (Refer to Section 2-1.)
(2) Turn off the power switch in the control panel. (Refer to Section 2-2.)
(3) Remove the KY-394 board. (Refer to Section 2-5-1 “8. KY-394 Board”.)
(4) Remove the connector on the EL display.
(5) Remove the four screws on the EL display.




(6) Install a new EL display by reversing the disassembly procedure of steps (1) through (5).

## 2-5-6. Replacement of FDD (Floppy Disk Drive) Unit

(1) Open the panel. (Refer to Section 2-1.)
(2) Turn off the power switch in the control panel. (Refer to Section 2-2.)
(3) Remove the four screws ⓐ and the FDD bracket.
(4) Disconnect the flexible card wire of the FDD unit.
(5) Remove the four screws ⓑ and then remove the FDD unit.




(6) Install a new FDD unit by reversing the disassembly procedure of steps (1) through (5).

## 2-6. Spare Parts

When ordering the boards and main parts, refer to the parts names and the parts numbers listed below.

### Replacement Parts

| Parts name | Parts No. |
|---|---|
| CN-1149 Board | A-8312-655-A |
| CN-1150 Board | A-8312-656-A |
| CPU-246 Board | A-8312-653-A |
| DC-92 (BKDS-7003) Board | A-8312-659-A |
| KY-324 Board | A-8269-506-A |
| KY-328 (BKDS-7030) Board | A-8273-689-A |
| KY-329 (BKDS-7031) Board | A-8273-691-A |
| KY-389A Board | A-8312-632-A |
| KY-389B Board | A-8312-634-A |
| KY-391 Board | A-8312-638-A |
| KY-392 Board | A-8312-640-A |
| KY-394 Board | A-8312-644-A |
| KY-440 Board | A-8320-348-A |
| KY-441 Board | A-8320-350-A |
| LE-142 Board | 1-658-284-11 |
| LE-144 Board | 1-658-286-11 |
| LE-146 Board | 1-658-288-11 |
| LE-147 (BKDS-7003) Board | 1-658-289-11 |
| LE-148 (BKDS-7003) Board | 1-658-290-11 |
| LE-180 (BKDS-7003) Board | 1-664-830-11 |
| Rotary Encoder | 1-467-705-11 |
| EL Display Unit | 1-466-954-11 |
| FDD (Floppy Disk Drive) Unit | 1-467-692-11 |
| Fader Assembly | A-8269-728-A |
| IF-523 (BKDS-7001) Board | Option BKDS-7001 |
| KY-395C (BKDS-7033) Board | Option BKDS-7033 |
| IF-629 (BKDS-7075) Board | Option BKDS-7075 |
| Redundant Power Supply Unit (BKDS-7091) | Option BKDS-7091 |

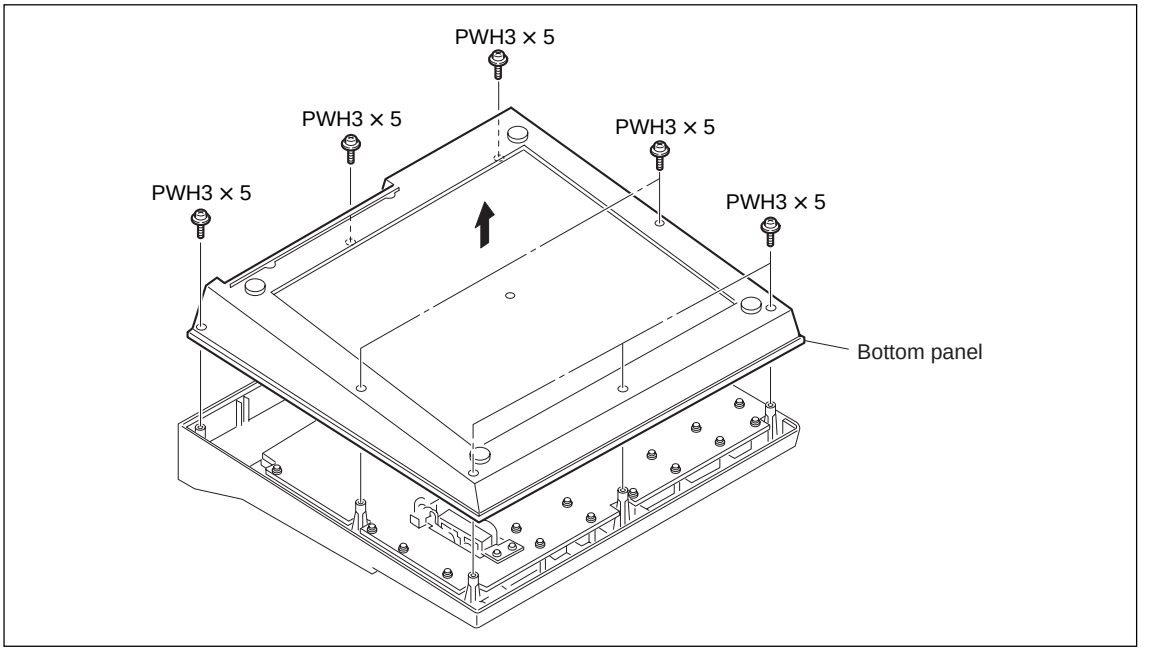
# Section 3
# BKDS-2010 Service Overview

**Note**

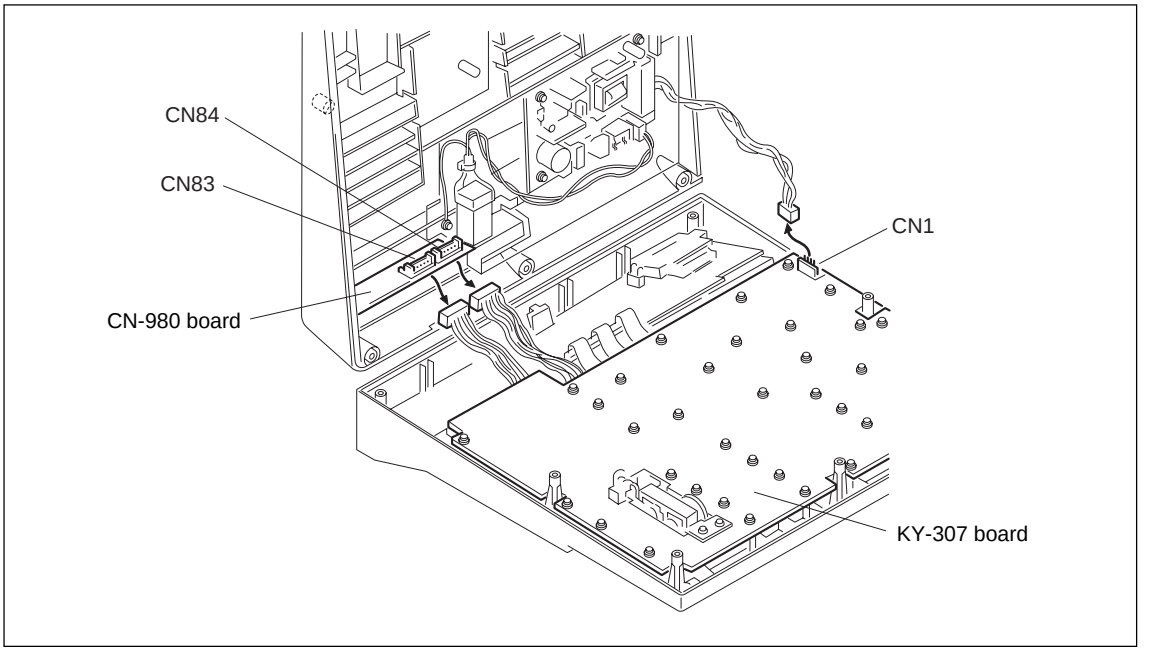
The BKDS-2010 does not have a power switch. When servicing, disconnect the AC connector on the rear panel.

## 3-1. Removal of Bottom Panel

(1) Remove the eight screws securing the bottom panel.

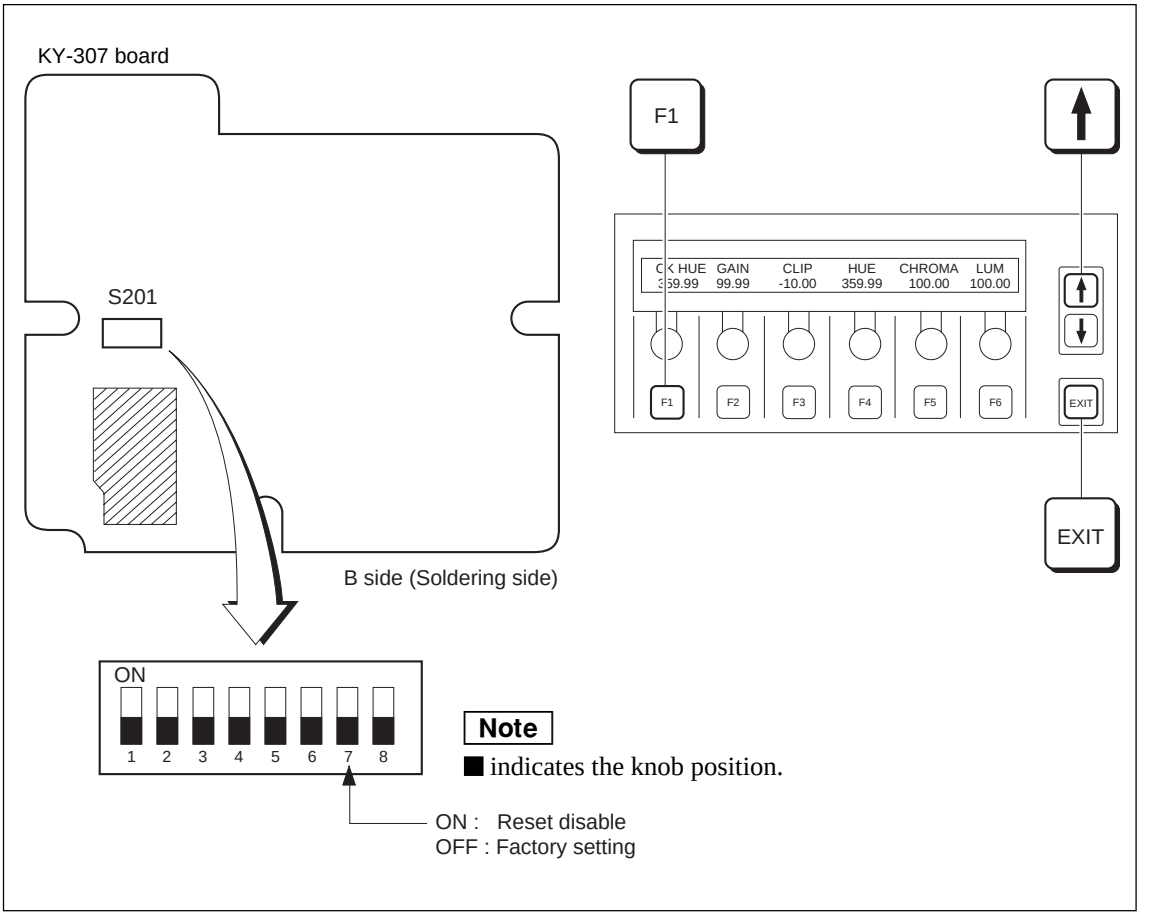



(2) Disconnect the two connectors (CN83 and CN84) on the CN-980 board and the connector (CN1) on the KY-307 board, then remove the bottom panel.



## 3-2. Hard Reset

The hard reset of the control panel can be performed by pressing the three buttons.
Before resetting, confirm that DIP switch S201 on the KY-307 board is set to OFF (factory setting).




**S201**-bit7

OFF : The hard reset can be performed by pushing [F1] key, [↑] key, and [EXIT] key at the same time. (factory setting)
ON : The hard reset cannot be performed.

**Note**
Never change the setting except bit7.

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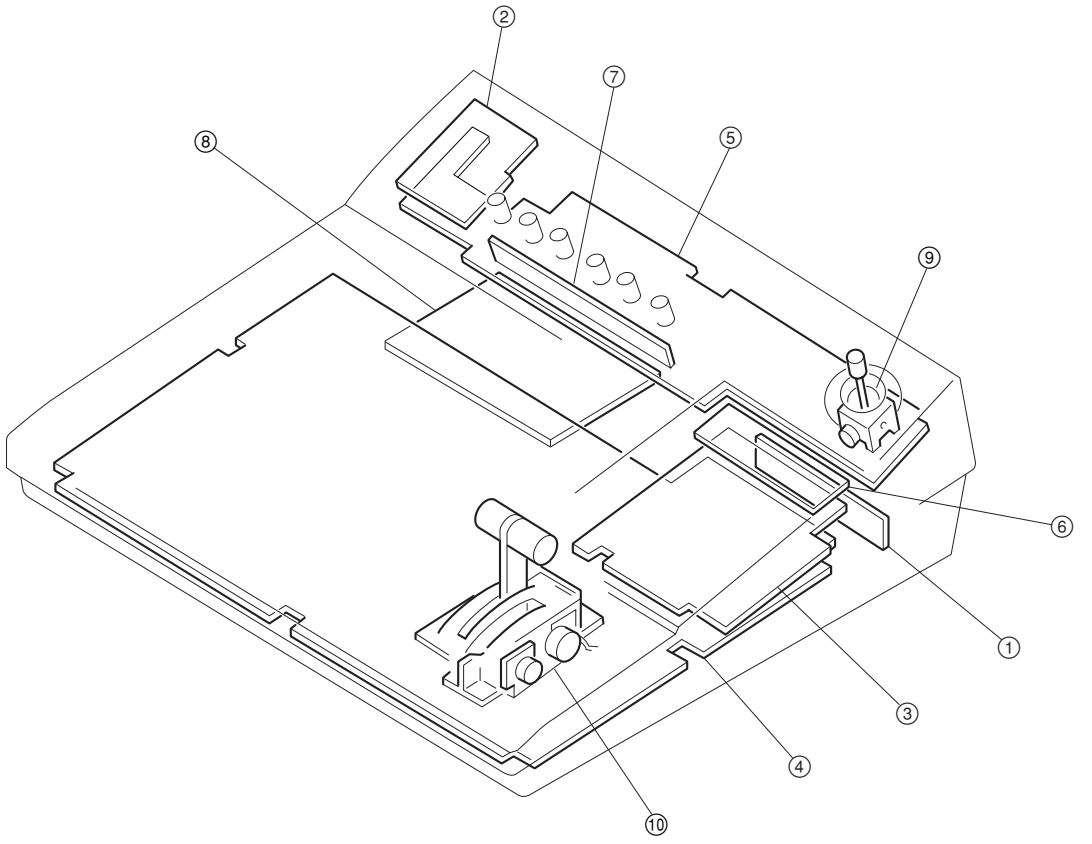
## 3-3. Location of Main Parts




① CN-980 board
② KY-291 board
③ KY-306 board
④ KY-307 board
⑤ KY-308 board
⑥ LED-178 board
⑦ VR-182 board
⑧ Switching regulator
⑨ Joy stick
⑩ Fader assembly

# 3-4. Replacement of Main Parts

## 3-4-1. Replacement of the Boards

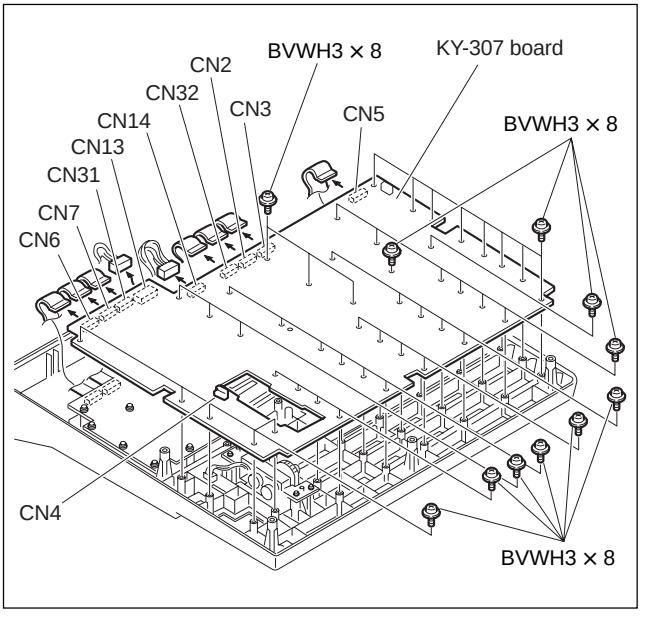
### Order of describing the board replacement

1. KY-307 Board
2. KY-306 Board
3. LED-178 Board
4. KY-308 Board
5. VR-182 Board
6. KY-291 Board
7. CN-980 Board

### Replacing Procedure

#### 1. KY-307 Board

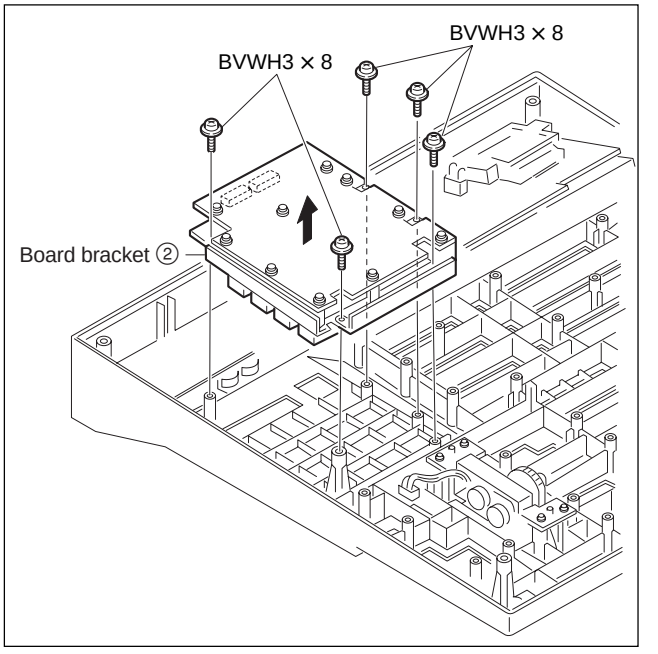
(1) Remove the bottom panel. (Refer to Section 3-1.)
(2) Remove the fourty-six screws.
(3) Disconnect the ten connectors (CN2 through CN7, CN13, CN14, CN31, and CN32)



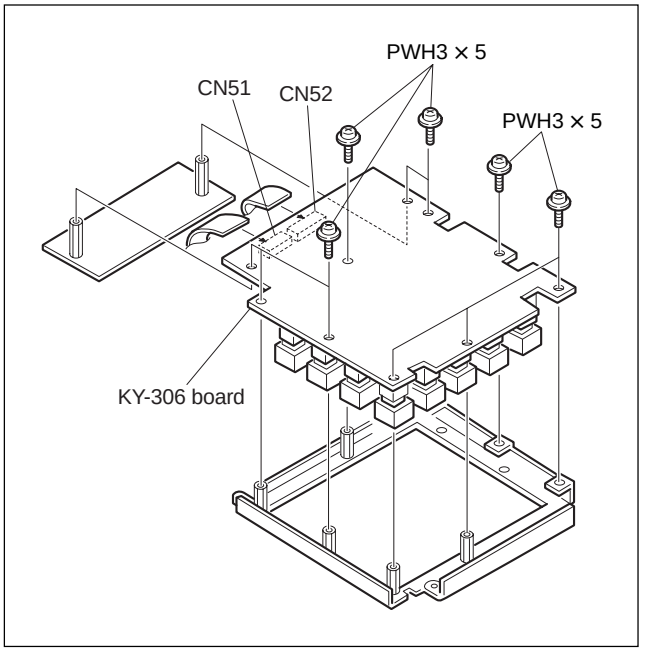

(4) Install a new KY-307 board by reversing the disassembly procedure of steps (1) through (3).

#### 2. KY-306 Board

(1) Remove the KY-307 board.
(Refer to "1. KY-307 Board".)
(2) Remove the five screws are remove the board bracket ②.



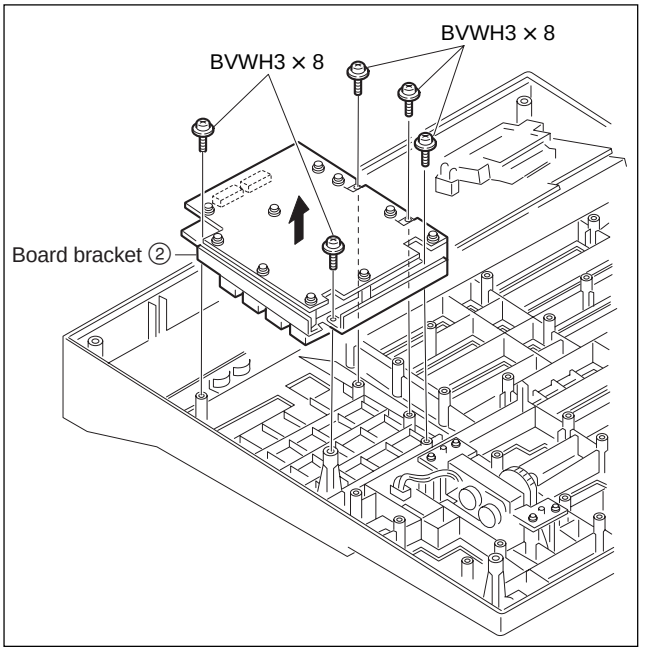

(3) Remove the ten screws.
(4) Disconnect the two connectors (CN51 and CN52).



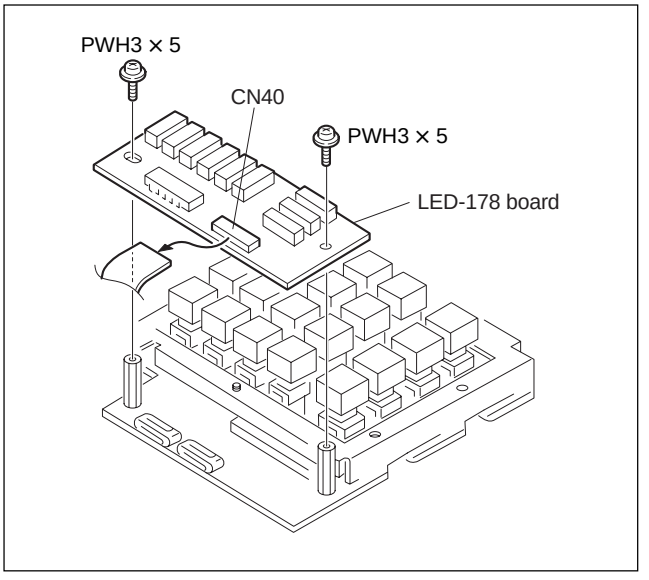

(5) Install a new KY-306 board by reversing the disassembly procedure of steps (1) through (4).

### 3. LED-178 Board

(1) Remove the KY-307 board.
(Refer to "1. KY-307 Board".)
(2) Remove the five screws and remove the board bracket ②.



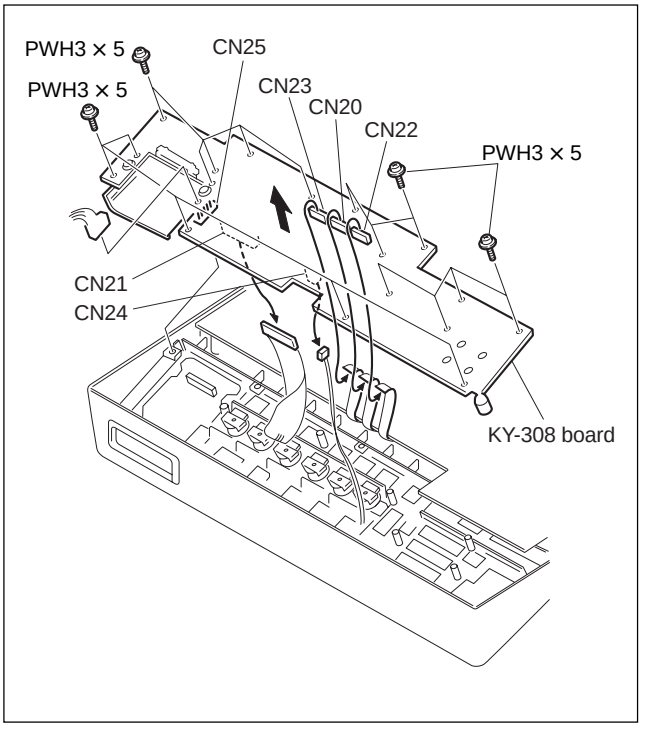

(3) Remove the two screws and remove the LED-178 board.
(4) Disconnect the connector (CN40).




(5) Install a new LED-178 board by reversing the disassembly procedure of steps (1) through (4).

### 4. KY-308 Board

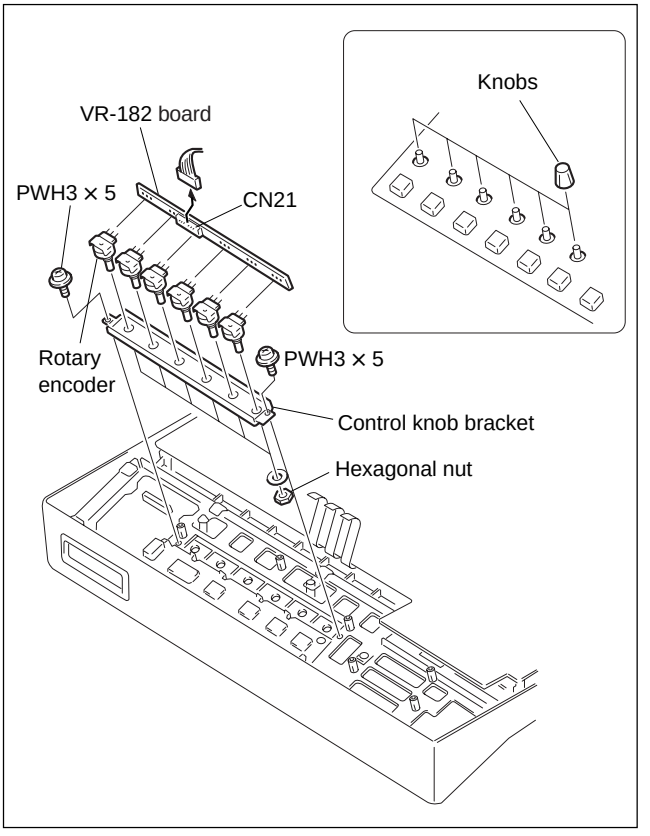
(1) Remove the memory pack holder.
(Refer to Section 3-4-7.)
(2) Remove the eighteen screws.
(3) Disconnect the six connector (CN20 through CN25).




(4) Install a new KY-308 board by reversing the disassembly procedure of steps (1) through (3).

### 5. VR-182 Board

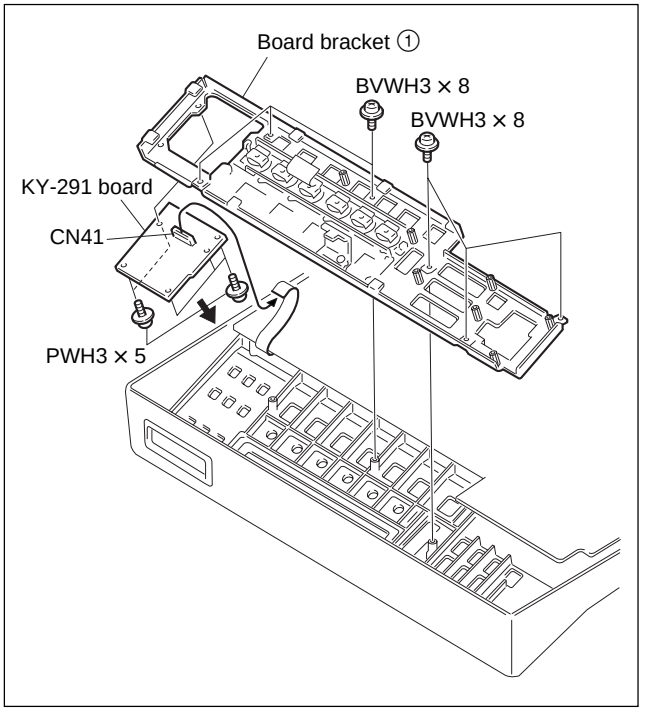
(1) Remove the six knobs.
(2) Remove the KY-308 board.
(Refer to “4. KY-308 Board”.)
(3) Remove the two screws securing the control knob bracket.
(4) Disconnect the connector (CN21).
(5) Remove the six hexagonal nuts.
(6) Remove the soldering of each terminal of the six rotary encoders.




(7) Install a new VR-182 board by reversing the disassembly procedure of steps (1) through (6).

### 6. KY-291 Board

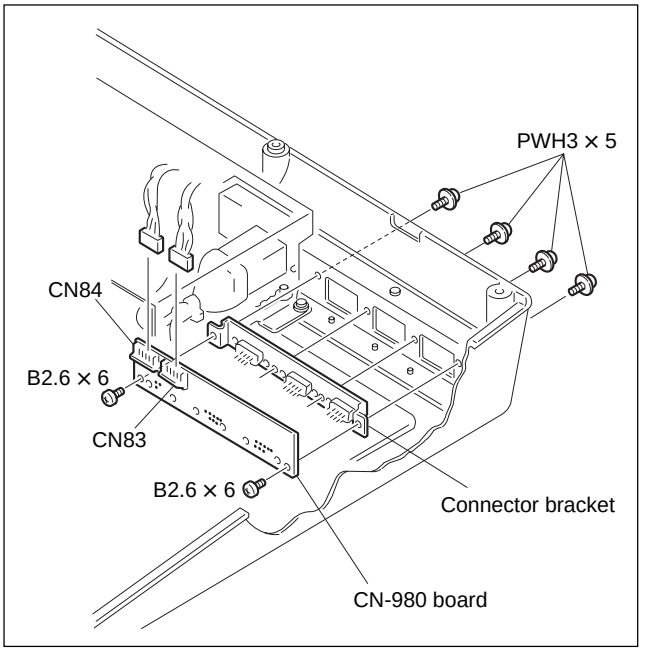
(1) Remove the KY-308 board.
(Refer to “4. KY-308 Board”.)
(2) Disconnect the connector (CN41).
(3) Remove the six screws and remove the board bracket ①.
(4) Remove the five screws and remove the KY-291 board.




(5) Install a new KY-291 board by reversing the disassembly procedure of steps (1) through (4).

### 7. CN-980 Board

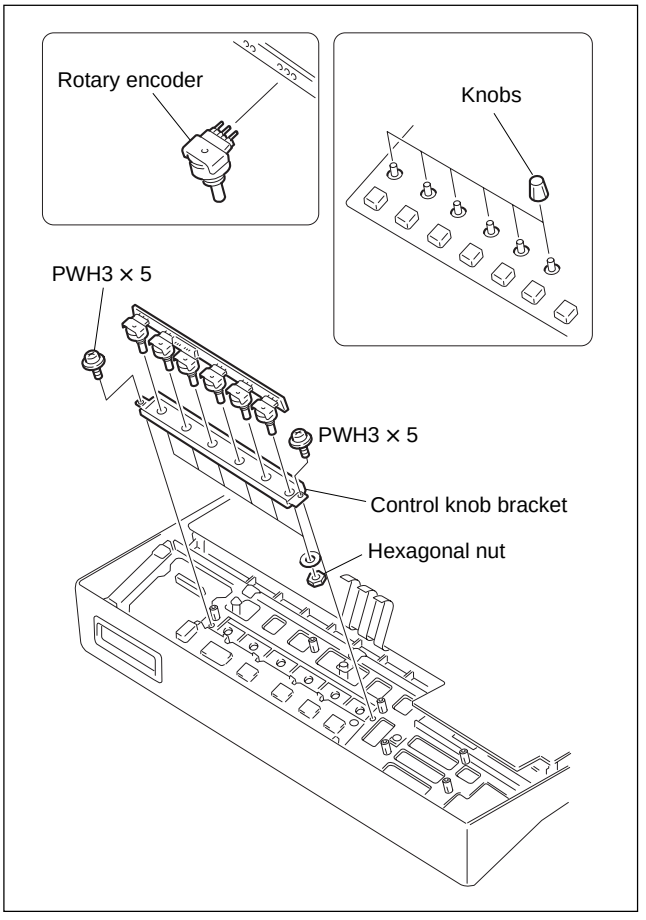
(1) Remove the bottom panel. (Refer to Section 3-1.)
(2) Remove the six screws.
(3) Disconnect the two connectors (CN83 and CN84).




(4) Install a new CN-980 board by reversing the disassembly procedure of steps (1) through (3).

## 3-4-2. Replacement of Rotary Encoder

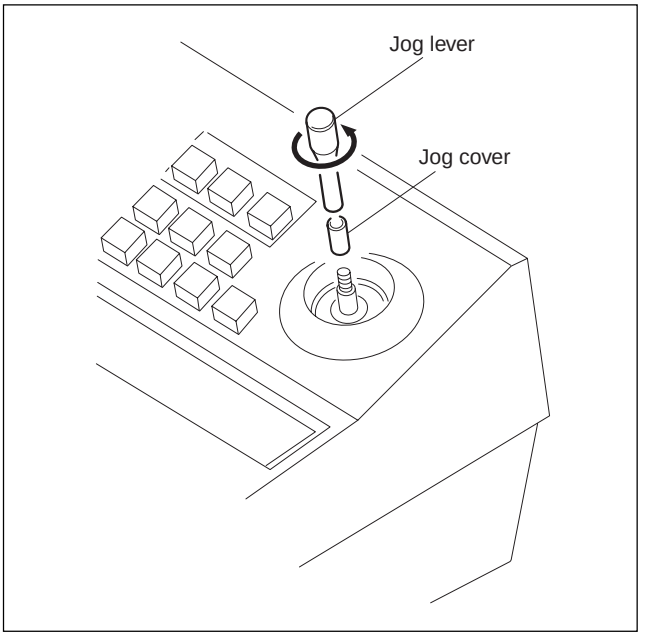
(1) Remove the six knobs.
(2) Remove the bottom panel. (Refer to Section 3-1.)
(3) Remove the KY-308 board.
(Refer to Section 3-4-1 “4. KY-308 Board”.)
(4) Remove the two screws and remove the control knob bracket.
(5) Remove the six hexagonal nuts.
(6) Remove the solder of all the terminals of the rotary encoder to be replaced.



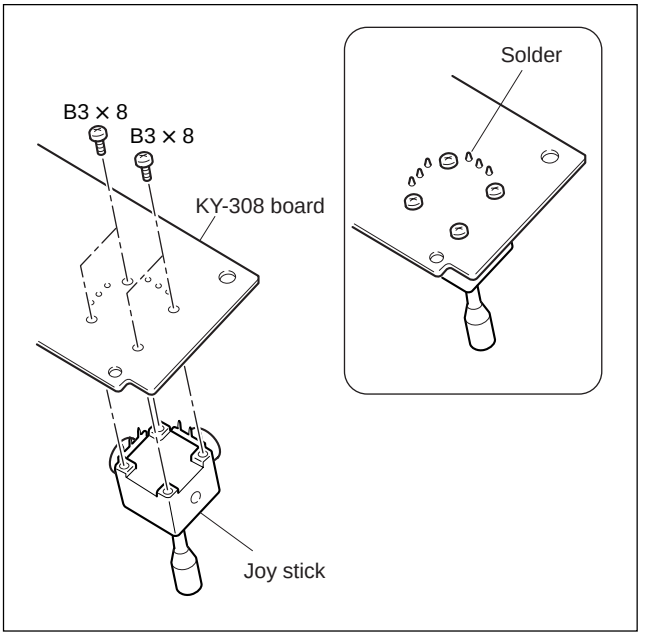

(7) Install a new rotary encoder by reversing the disassembly procedure of step (1) through (6).

## 3-4-3. Replacement of Joy Stick

(1) Turn the jog lever in the direction of the arrow and remove the jog cover.



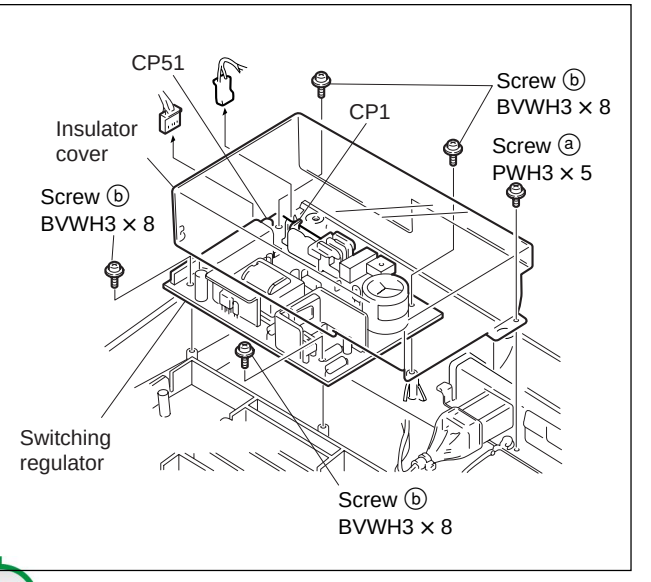

(2) Remove the bottom plate. (Refer to Section 3-1.)
(3) Remove the KY-308 board.
(Refer to Section 3-4-1 “4. KY-308 Board”.)
(4) Remove the four screws on the KY-308 board.
(5) Remove the solder (six positions) of the joy stick and remove the joy stick.




(6) Install a new joy stick by reversing the disassembly procedure of steps (1) through (5).

## 3-4-4. Replacement of Switching Regulator

(1) Remove the bottom panel. (Refer to Section 3-1.)
(2) Remove a screw ⓐ and remove the insulator cover.
(3) Remove the four screws ⓑ.
(4) Disconnect the two connectors (CP51 and CP1) then remove the switching regulator.




(5) Install a new switching regulator by reversing the disassembly procedure of steps (1) through (4).

### Replacement of Fuse

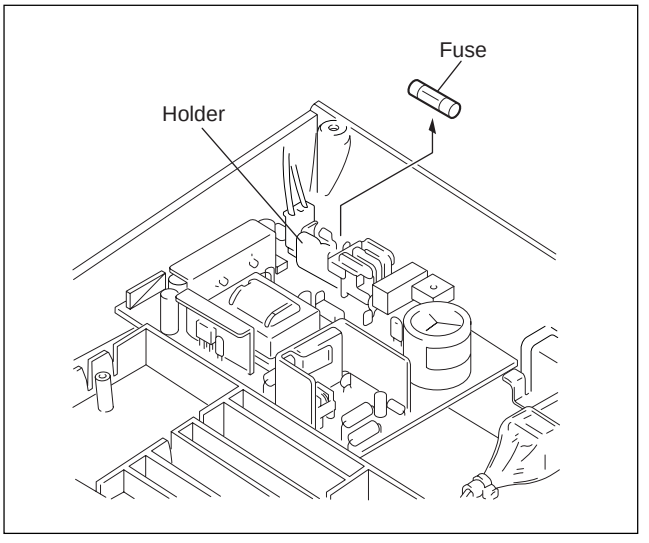
**WARNING**

Fuse is the critical part for safety.
Replacing with the fuses other than the specified ones will cause fire and electric shock.

Sony part No. : 1-532-826-11

### Replacing Procedure

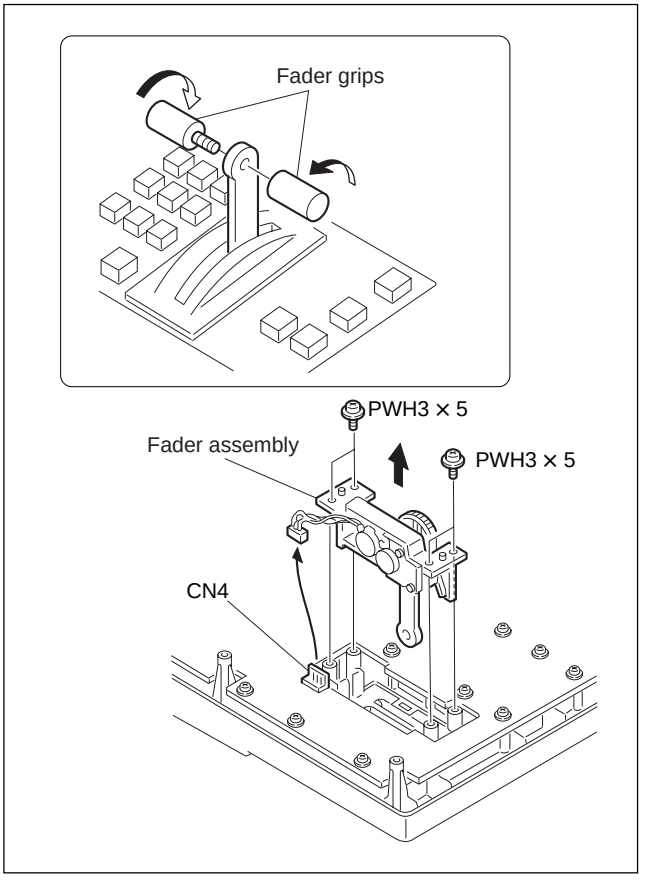
(1) Remove the fuse from the holder.




(2) Insert a new fuse into the holder.

## 3-4-5. Replacement of Fader Assembly

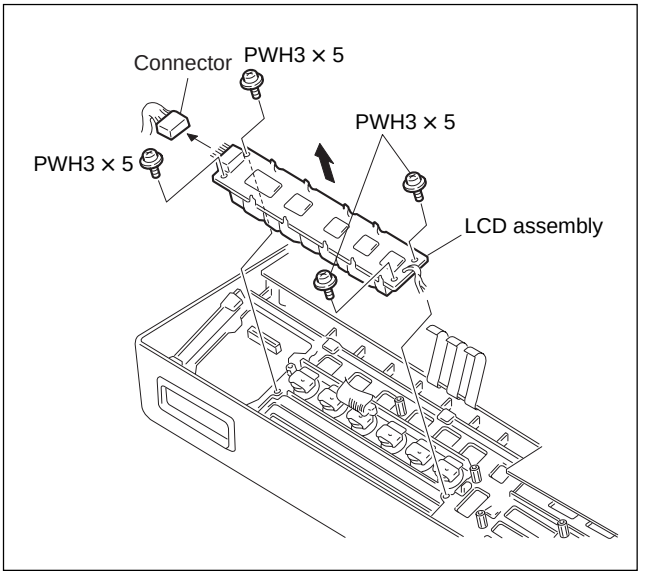
(1) Turn the fader grip in the direction of the arrow, then remove it.
(2) Remove the bottom panel. (Refer to Section 3-1.)
(3) Disconnect the connector (CN4).
(4) Remove the four screws, then remove the fader assembly.




(5) Install a new fader assembly by reversing the disassembly procedure of steps (1) through (4).

## 3-4-6. Replacement of LCD Assembly

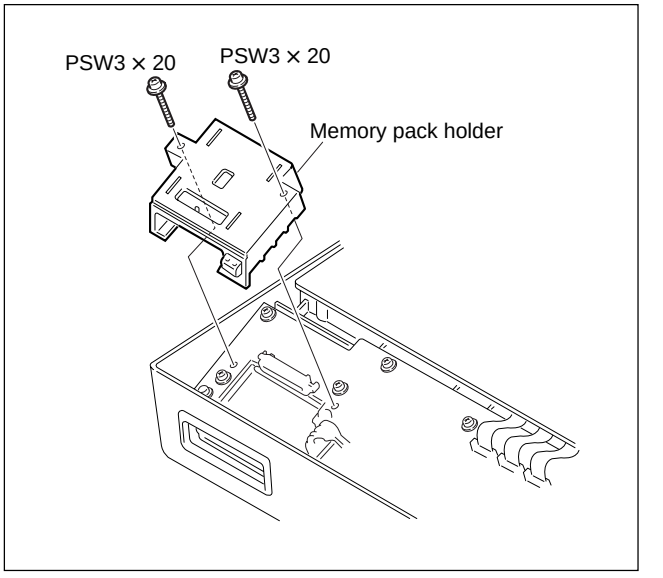
(1) Remove the bottom panel. (Refer to Section 3-1.)
(2) Remove the KY-308 board.
(Refer to Section 3-4-1 “4. KY-308 Board”.)
(3) Remove the four screws.
(4) Disconnect the connector, then remove the LCD assembly.




(5) Install a new LCD assembly by reversing the disassembly procedure of steps (1) through (4).

## 3-4-7. Replacement of Memory Pack Holder

(1) Remove the bottom panel. (Refer to Section 3-1.)
(2) Remove the two screws, then remove the memory pack holder.




(3) Install a new memory pack holder by reversing the disassembly procedure of steps (1) and (2).

## 3-5. Spare Parts

When ordering the boards and main parts, refer to the parts names and the parts numbers listed below.

### Replacement parts

| Parts name | Parts No. |
|---|---|
| CN-980 Board | 1-650-037-12 |
| KY-291 Board | 1-650-033-12 |
| KY-306 Board | A-8275-295-A |
| KY-307 Board | A-8275-297-A |
| KY-308 Board | A-8275-298-A |
| LED-178 Board | A-8275-292-A |
| VR-182 Board | 1-650-035-12 |
| Fader Assembly | A-6279-486-G |
| LCD Assembly | A-8275-312-A |
| Memory Pack Holder | X-3167-263-2 |
| Joy Stick | 1-238-724-11 |
| Switching Regulator | 1-413-769-12 |
| Rotary Encoder | 1-467-377-11 |

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# Section 4
# BKDM-3010 Service Overview

**Note**

The power of BKDM-3010 is supplied from the HDS-7150/7100.
When servicing the BKDM-3010, turn off the power of power supply unit HKDS-7695 connecting to the HDS-7150/7100.
At this time, confirm that the LED of the buttons on the BKDM-3010 goes out.

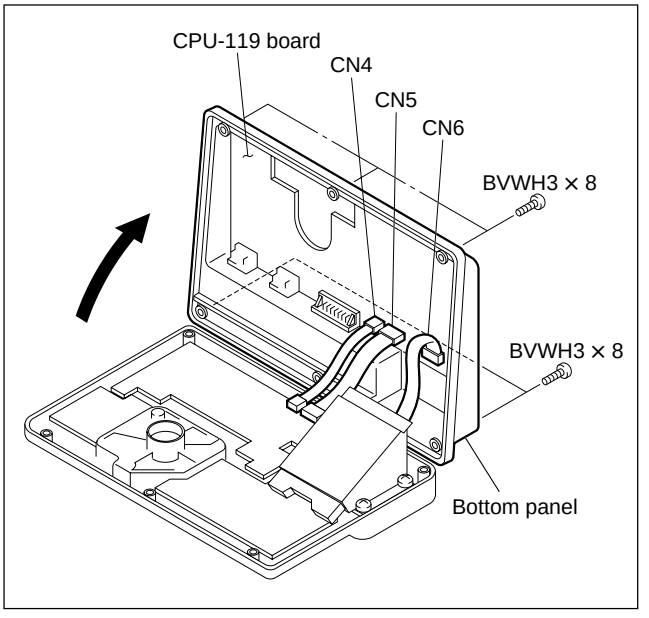
## 4-1. Removal of Bottom Panel

(1) Turn the the BKDM-3010 upside down.
(2) Remove the six screws, then open the bottom panel in the direction of the arrow.

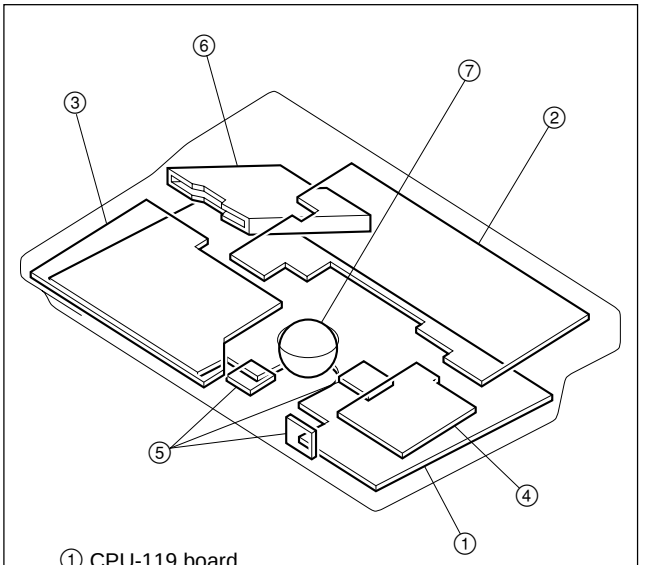
**Note**

Pay attention to the direction when opening the bottom panel.
Do not open it in the reverse direction. Connectors are pintched by the bottom panel.

(3) Disconnect the three connectors (CN4, CN5, and CN6) on the CPU-119 board, then remove the bottom panel.




## 4-2. Location of Main Parts

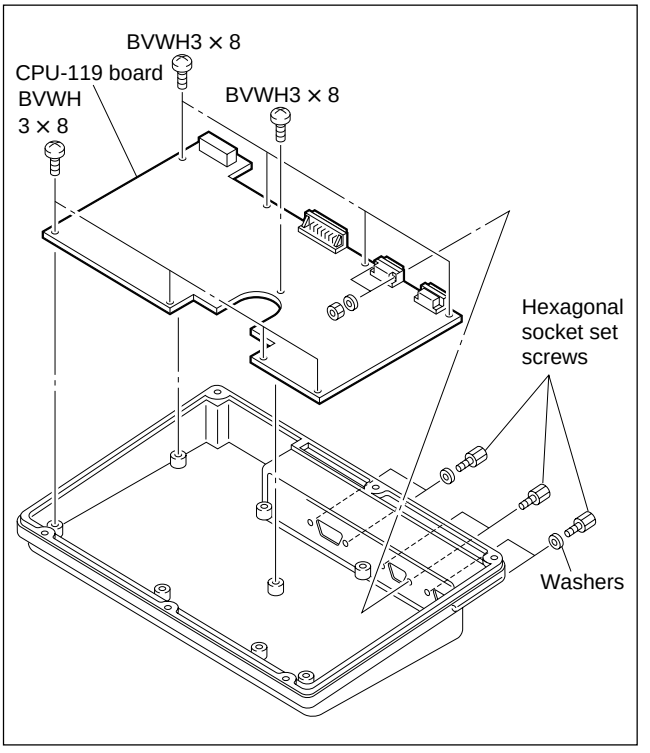


# 4-3. Replacement of Main Parts

## 4-3-1. Replacement of the Boards

### 1. CPU-119 Board

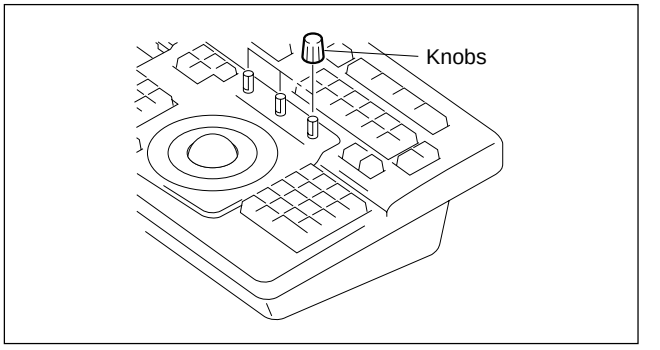
(1) Remove the bottom panel. (Refer to Section 4-1.)
(2) Remove the hexagonal socket set screws securing the three D-sub connectors and the washer.
(3) Remove the nine screws on the CPU-119 board, then remove the board.



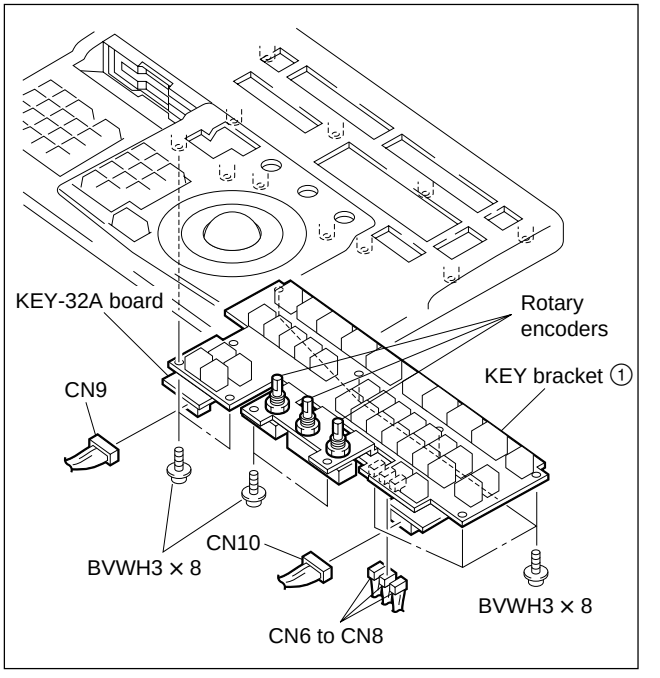

(4) Install a new CPU-119 board by reversing the disassembly procedure of steps (1) through (3).

### 2. KEY-32A Board

(1) Remove the three knobs.



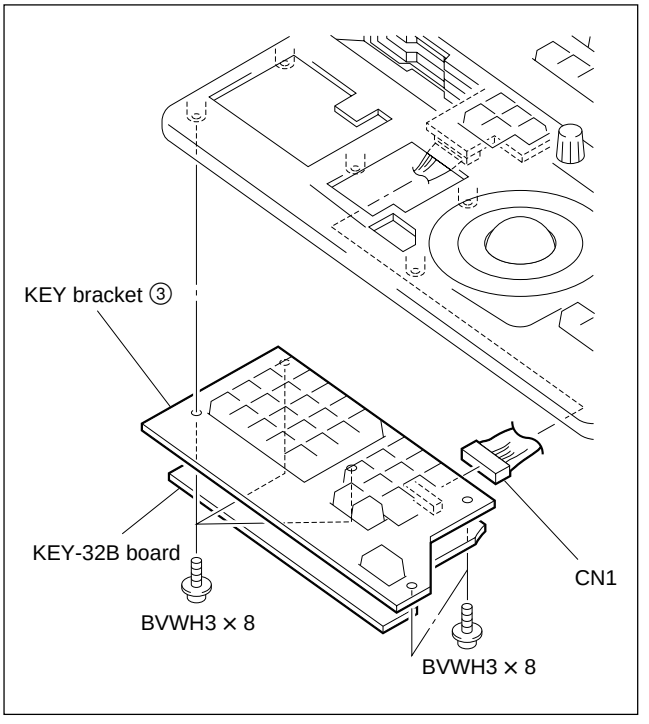

(2) Remove the bottom panel. (Refer to Section 4-1.)
(3) Remove the three screws and remove the FD bracket. (Refer to step (2) in Section 4-3-2.)
(4) Disconnect the five connectors (CN6 through CN10).
(5) Remove the eleven screws.
(6) Remove the KEY-32A board with the rotary encoders and the KEY bracket ① attached.




(7) Install a new KEY-32A board by reversing the disassembly procedure of steps (1) through (6).

### 3. KEY-32B Board

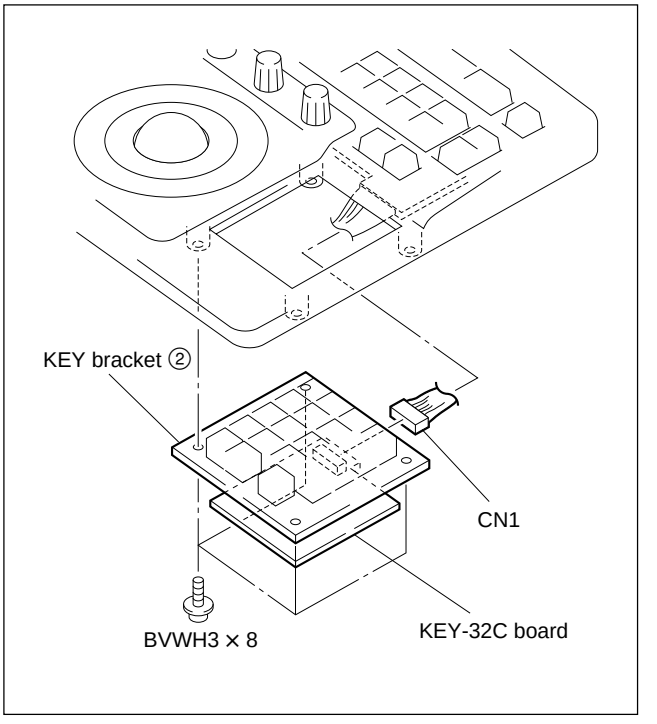
(1) Remove the bottom panel. (Refer to Section 4-1.)
(2) Disconnect the connector (CN1).
(3) Remove the five screws.
(4) Remove the KEY-32B board with the KEY bracket ③ attatched.




(5) Install a new KEY-32B board by reversing the disassembly procedure of steps (1) through (4).

### 4. KEY-32C Board

(1) Remove the bottom panel. (Refer to Section 4-1.)
(2) Disconnect the connector (CN1).
(3) Remove the four screws.
(4) Remove the KEY-32C board with the KEY bracket ② attatched.

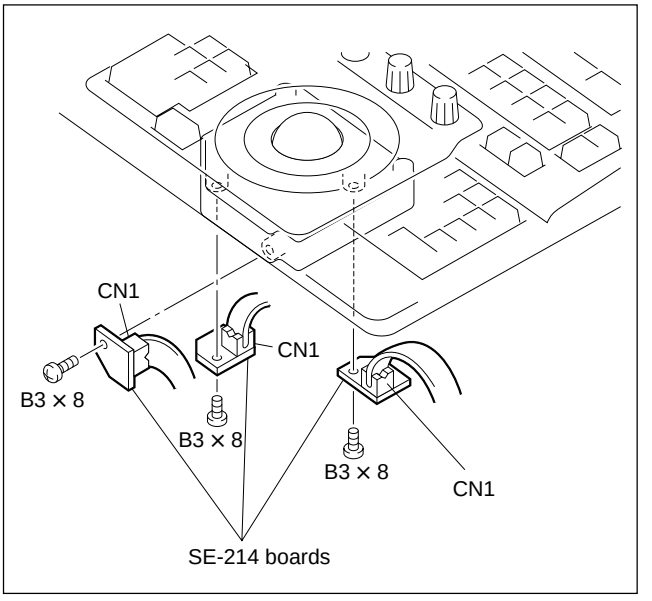



(5) Install a new KEY-32C board by reversing the disassembly procedure of steps (1) through (4).

### 5. SE-214 Board

The SE-214 boards are used in the BKDM-3010.

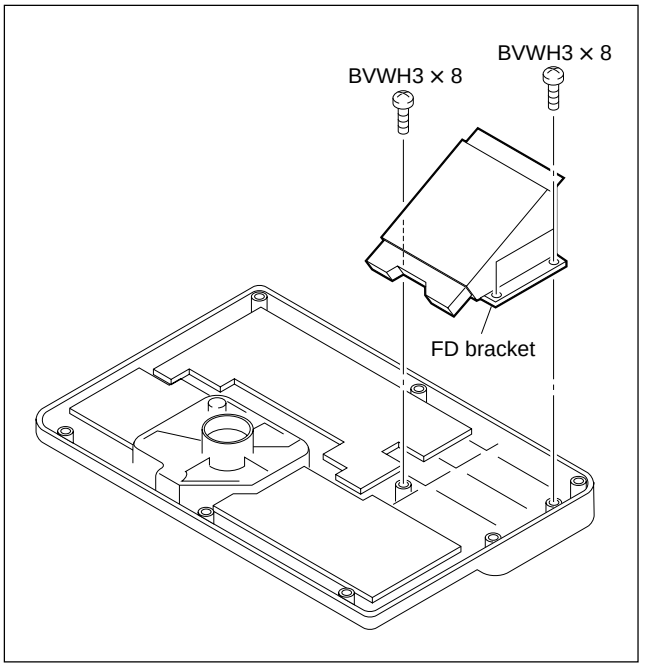
(1) Remove the bottom panel. (Refer to Section 4-1.)
(2) Disconnect the connector (CN1).
(3) Remove the screw, then remove the SE-214 board.



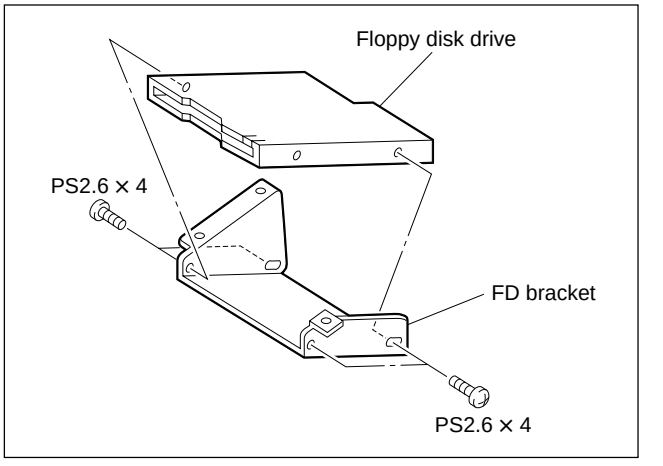

(4) Install a new SE-214 board by reversing the disassembly procedure of steps (1) through (3).

## 4-3-2. Replacement of Floppy Disk Drive

(1) Remove the bottom panel. (Refer to Section 4-1.)
(2) Remove the three screws and remove the FD bracket.




(3) Remove the four screws, then remove the floppy disk drive.




(4) Install a new floppy disk drive by reversing the disassembly procedure of steps (1) through (3).

## 4-4. Backup Battery

To store a part of setup data and a real-time clock, Ni-Cd batteries are installed on the CPU-119 board in the BKDM-3010.
To charge the Ni-Cd batteries sufficiently, turn on the power of power supply unit HKDS-7695 connecting to the HDS-7150/7100 for about ten hours. The sufficiently charged Ni-Cd batteries enable data to be stored for about one week.

**Notes**

- The life of a Ni-Cd battery is about ten years. Replace the Ni-Cd battery after a lapse of ten years since the BKDM-3010 is installed or the battery is last replaced. (For the replacement procedure of the battery, refer to the Maintenance Manual Part 2.)
- Discard the Ni-cd battery according to the notice indicated in “For Safety” is this manual.

## 4-5. Spare Parts

When ordering the boards and main parts, refer to the parts names and the parts numbers listed below.

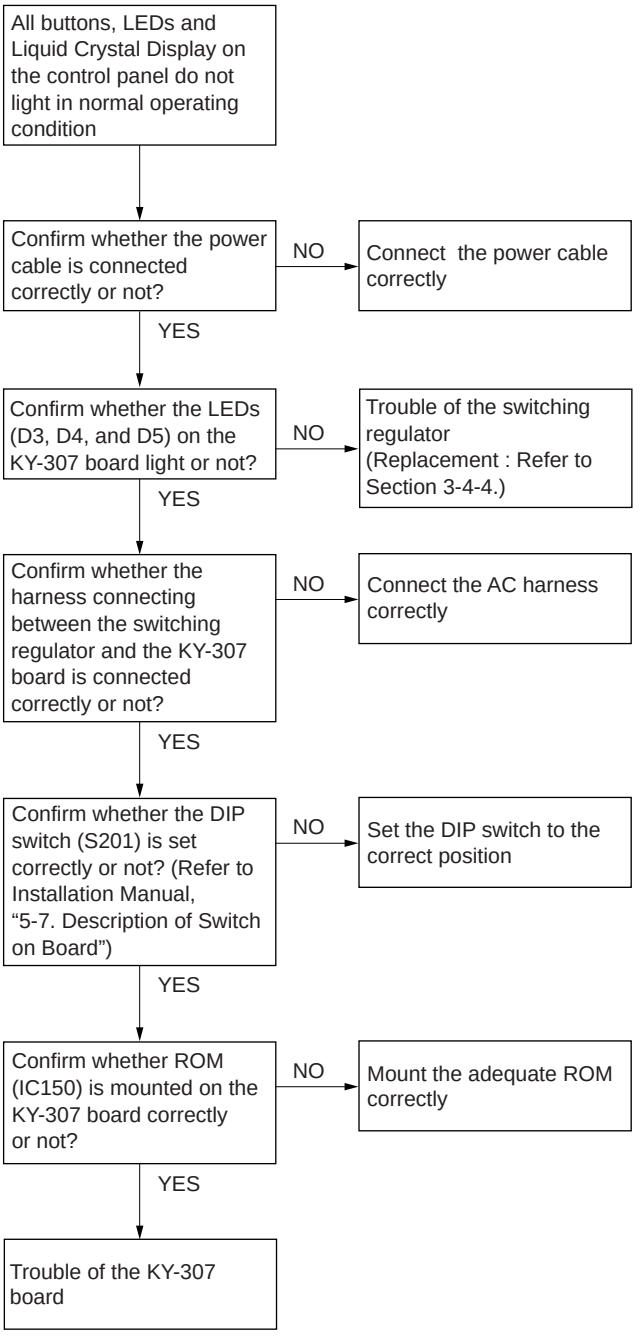
### Replacement parts

| Parts name | Parts No. |
|---|---|
| CPU-119 Board | A-8275-385-A |
| KEY-32A Board | A-8275-382-A |
| KEY-32B Board | A-8275-383-A |
| KEY-32C Board | A-8275-384-A |
| SE-214 Board | 1-649-905-11 |
| Floppy Disk Drive Unit | 1-467-692-11 |

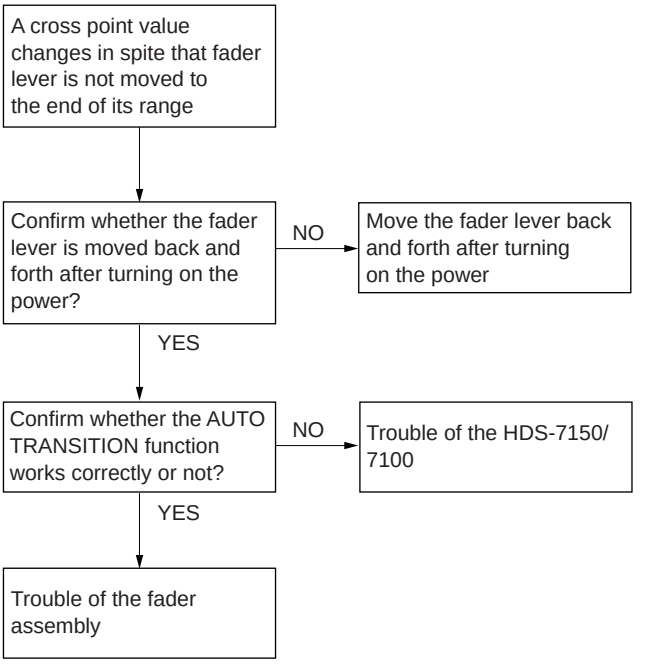
# Section 5
# Troubleshooting

## 5-1. BKDS-2010

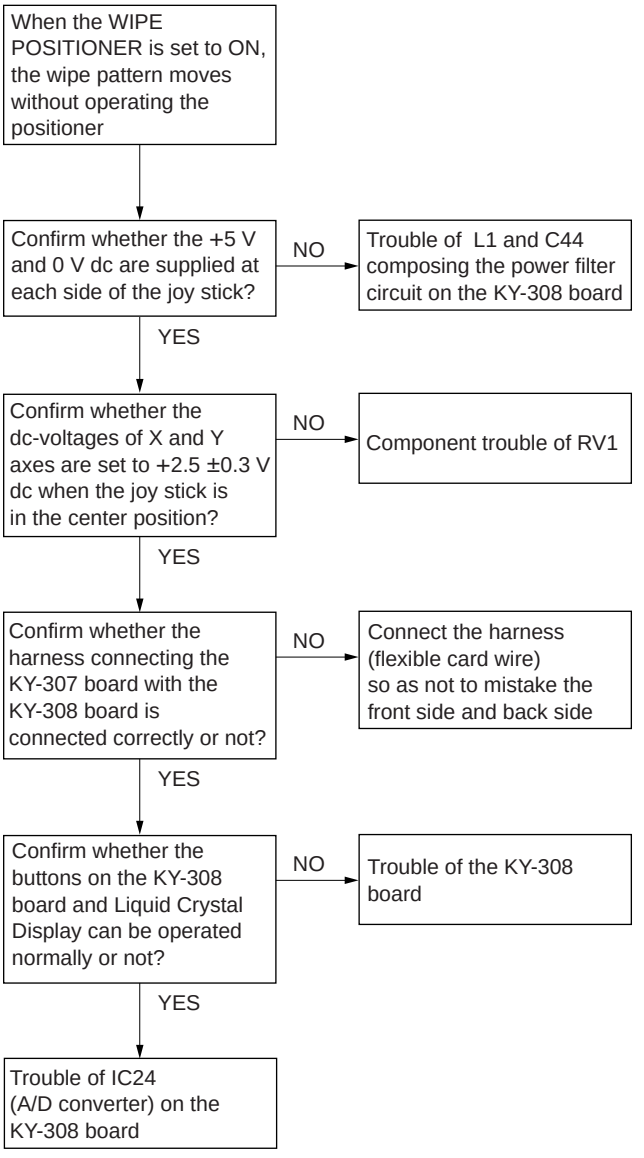
### 5-1-1. Trouble at Power-on


All buttons, LEDs and Liquid Crystal Display on the control panel do not light in normal operating condition
Confirm whether the power cable is connected correctly or not?
NO
Connect the power cable correctly
YES
Confirm whether the LEDs (D3, D4, and D5) on the KY-307 board light or not?
NO
Trouble of the switching regulator (Replacement : Refer to Section 3-4-4.)
YES
Confirm whether the harness connecting between the switching regulator and the KY-307 board is connected correctly or not?
NO
Connect the AC harness correctly
YES
Confirm whether the DIP switch (S201) is set correctly or not? (Refer to Installation Manual, “5-7. Description of Switch on Board”)
NO
Set the DIP switch to the correct position
YES
Confirm whether ROM (IC150) is mounted on the KY-307 board correctly or not?
NO
Mount the adequate ROM correctly
YES
Trouble of the KY-307 board

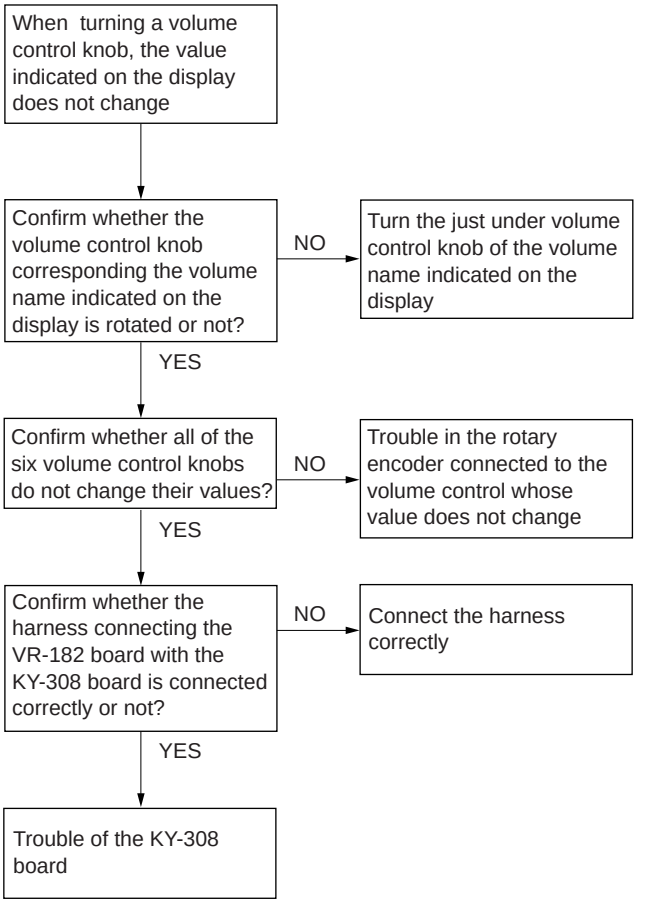
### 5-1-2. Trouble of Transition Effects


A cross point value changes in spite that fader lever is not moved to the end of its range
Confirm whether the fader lever is moved back and forth after turning on the power?
NO
Move the fader lever back and forth after turning on the power
YES
Confirm whether the AUTO TRANSITION function works correctly or not?
NO
Trouble of the HDS-7150/ 7100
YES
Trouble of the fader assembly

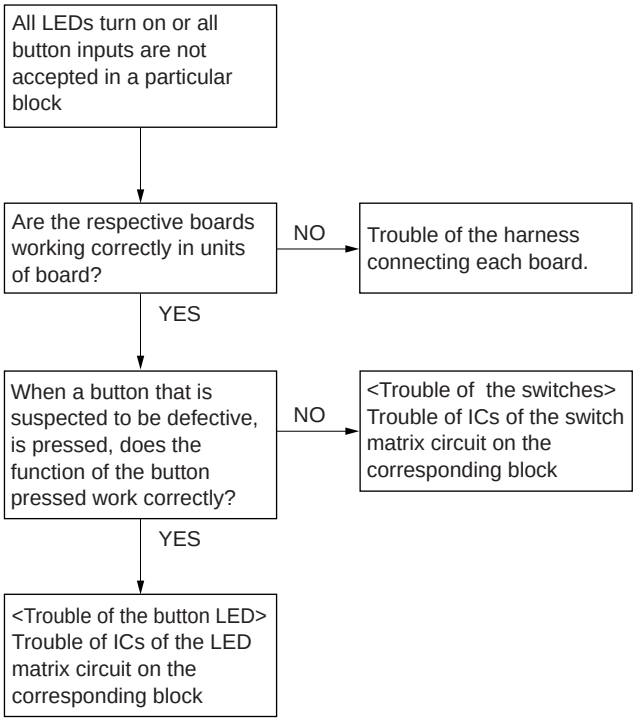
## 5-1-3. Trouble of Joy Stick


When the WIPE POSITIONER is set to ON, the wipe pattern moves without operating the positioner
Confirm whether the +5 V and 0 V dc are supplied at each side of the joy stick?
NO
Trouble of L1 and C44 composing the power filter circuit on the KY-308 board
YES
Confirm whether the dc-voltages of X and Y axes are set to +2.5 ±0.3 V dc when the joy stick is in the center position?
NO
Component trouble of RV1
YES
Confirm whether the harness connecting the KY-307 board with the KY-308 board is connected correctly or not?
NO
Connect the harness (flexible card wire) so as not to mistake the front side and back side
YES
Confirm whether the buttons on the KY-308 board and Liquid Crystal Display can be operated normally or not?
NO
Trouble of the KY-308 board
YES
Trouble of IC24 (A/D converter) on the KY-308 board

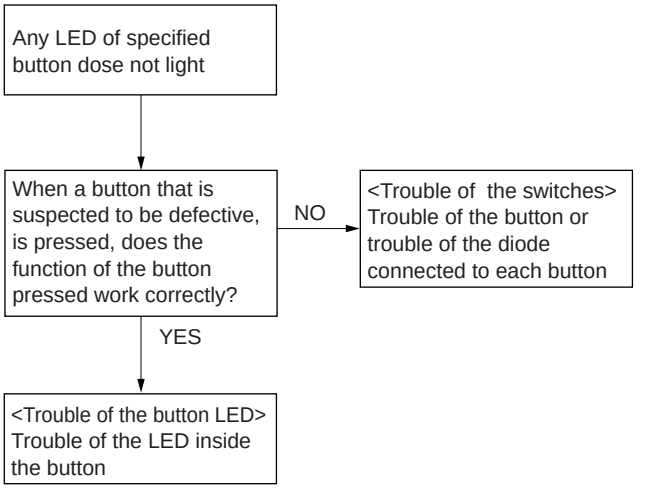
## 5-1-4. Trouble of Volume Controls


When turning a volume control knob, the value indicated on the display does not change
Confirm whether the volume control knob corresponding the volume name indicated on the display is rotated or not?
NO
Turn the just under volume control knob of the volume name indicated on the display
YES
Confirm whether all of the six volume control knobs do not change their values?
NO
Trouble in the rotary encoder connected to the volume control whose value does not change
YES
Confirm whether the harness connecting the VR-182 board with the KY-308 board is connected correctly or not?
NO
Connect the harness correctly
YES
Trouble of the KY-308 board

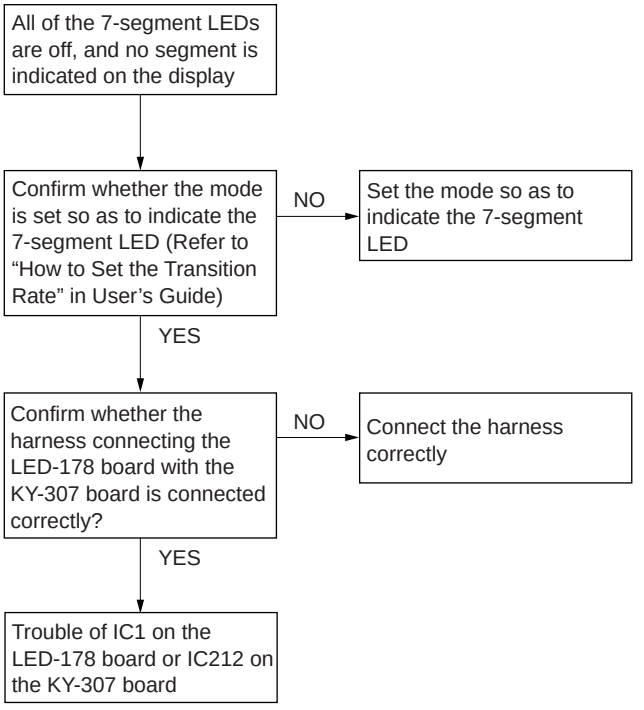
## 5-1-5. Trouble of Buttons



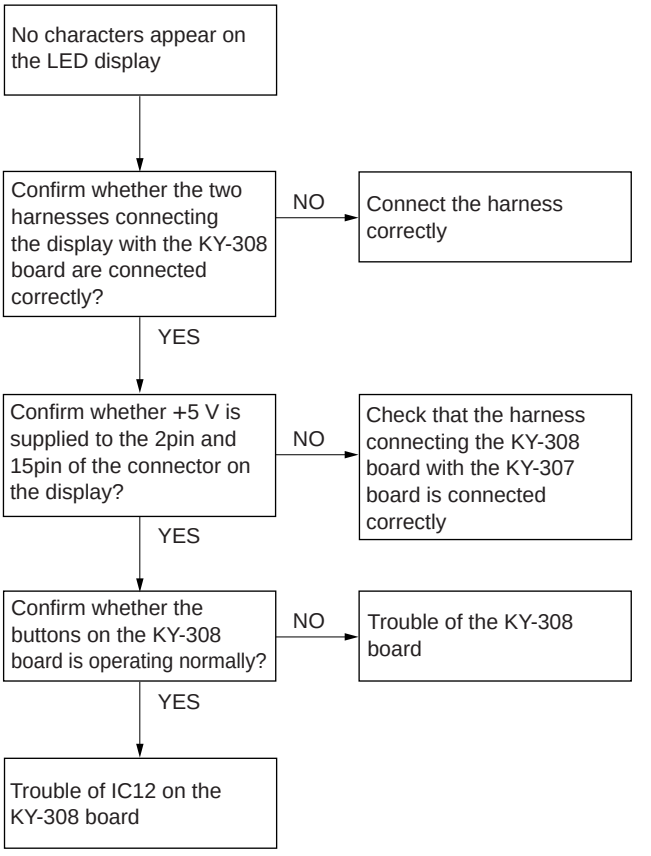

## 5-1-6. Trouble of Specified Button



## 5-1-7. Trouble of 7-segment LED (LED-178 board)


All of the 7-segment LEDs are off, and no segment is indicated on the display
Confirm whether the mode is set so as to indicate the 7-segment LED (Refer to “How to Set the Transition Rate” in User’s Guide)
NO
Set the mode so as to indicate the 7-segment LED
YES
Confirm whether the harness connecting the LED-178 board with the KY-307 board is connected correctly?
NO
Connect the harness correctly
YES
Trouble of IC1 on the LED-178 board or IC212 on the KY-307 board

## 5-1-8. Trouble of Liquid Crystal Display


No characters appear on the LED display
Confirm whether the two harnesses connecting the display with the KY-308 board are connected correctly?
NO
Connect the harness correctly
YES
Confirm whether +5 V is supplied to the 2pin and 15pin of the connector on the display?
NO
Check that the harness connecting the KY-308 board with the KY-307 board is connected correctly
YES
Confirm whether the buttons on the KY-308 board is operating normally?
NO
Trouble of the KY-308 board
YES
Trouble of IC12 on the KY-308 board

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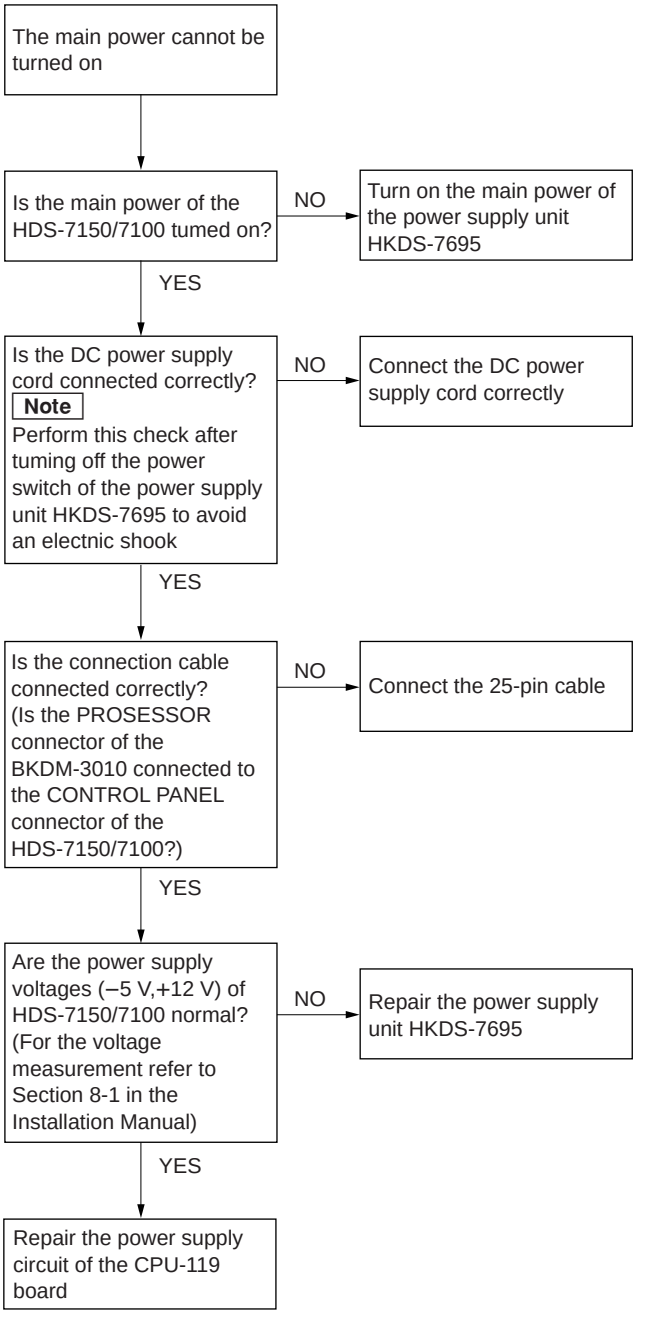
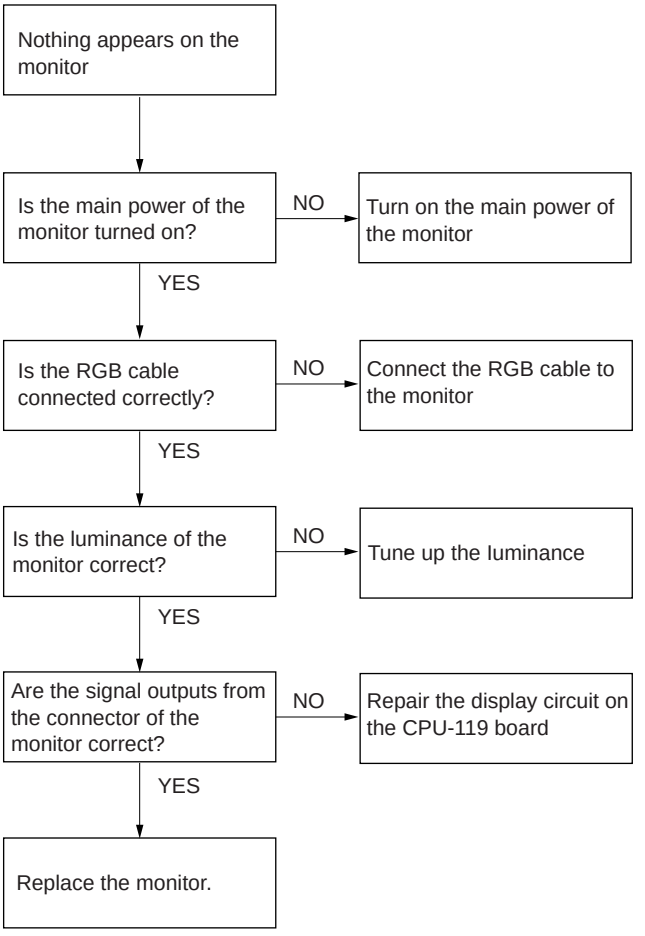
# 5-2. BKDM-3010

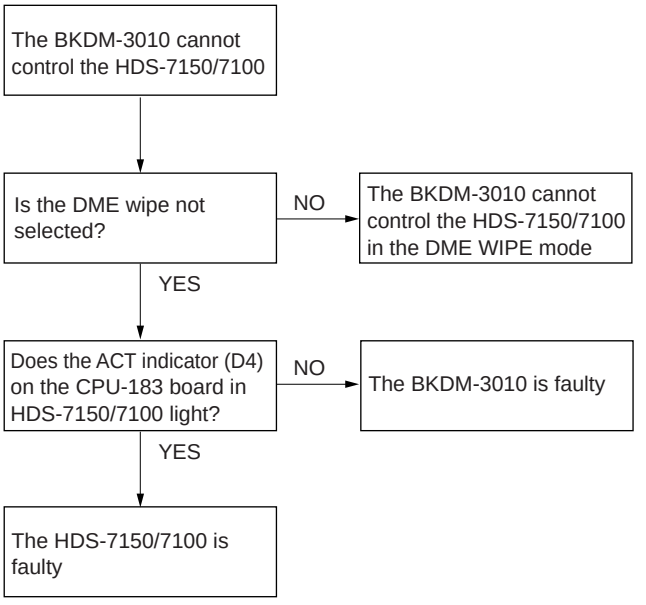
## 5-2-1. Trouble at Power-on


The main power cannot be turned on
Is the main power of the HDS-7150/7100 tumed on?
NO
Turn on the main power of the power supply unit HKDS-7695
YES
Is the DC power supply cord connected correctly?
Note
Perform this check after tuming off the power switch of the power supply unit HKDS-7695 to avoid an electnic shook
NO
Connect the DC power supply cord correctly
YES
Is the connection cable connected correctly? (Is the PROSESSOR connector of the BKDM-3010 connected to the CONTROL PANEL connector of the HDS-7150/7100?)
NO
Connect the 25-pin cable
YES
Are the power supply voltages (–5 V,+12 V) of HDS-7150/7100 normal? (For the voltage measurement refer to Section 8-1 in the Installation Manual)
NO
Repair the power supply unit HKDS-7695
YES
Repair the power supply circuit of the CPU-119 board

## 5-2-2. Trouble of the Monitor


Nothing appears on the monitor
Is the main power of the monitor turned on?
NO
Turn on the main power of the monitor
YES
Is the RGB cable connected correctly?
NO
Connect the RGB cable to the monitor
YES
Is the luminance of the monitor correct?
NO
Tune up the luminance
YES
Are the signal outputs from the connector of the monitor correct?
NO
Repair the display circuit on the CPU-119 board
YES
Replace the monitor.

## 5-2-3. Trouble in Controlling HDS-7150/7100


The BKDM-3010 cannot control the HDS-7150/7100
Is the DME wipe not selected?
NO
The BKDM-3010 cannot control the HDS-7150/7100 in the DME WIPE mode
YES
Does the ACT indicator (D4) on the CPU-183 board in HDS-7150/7100 light?
NO
The BKDM-3010 is faulty
YES
The HDS-7150/7100 is faulty

# Section 6
# Diagnostics

## 6-1. Self Diagnostics of BKDS-7017

### 6-1-1. Self Diagnosis Mode

The self diagnosis consisting of the following eleven menu items can be performed by connecting the terminals in Section 6-1-3 and start the self diagnosis mode. Run the tests in each menu.
(Refer to Section 6-1-6.)

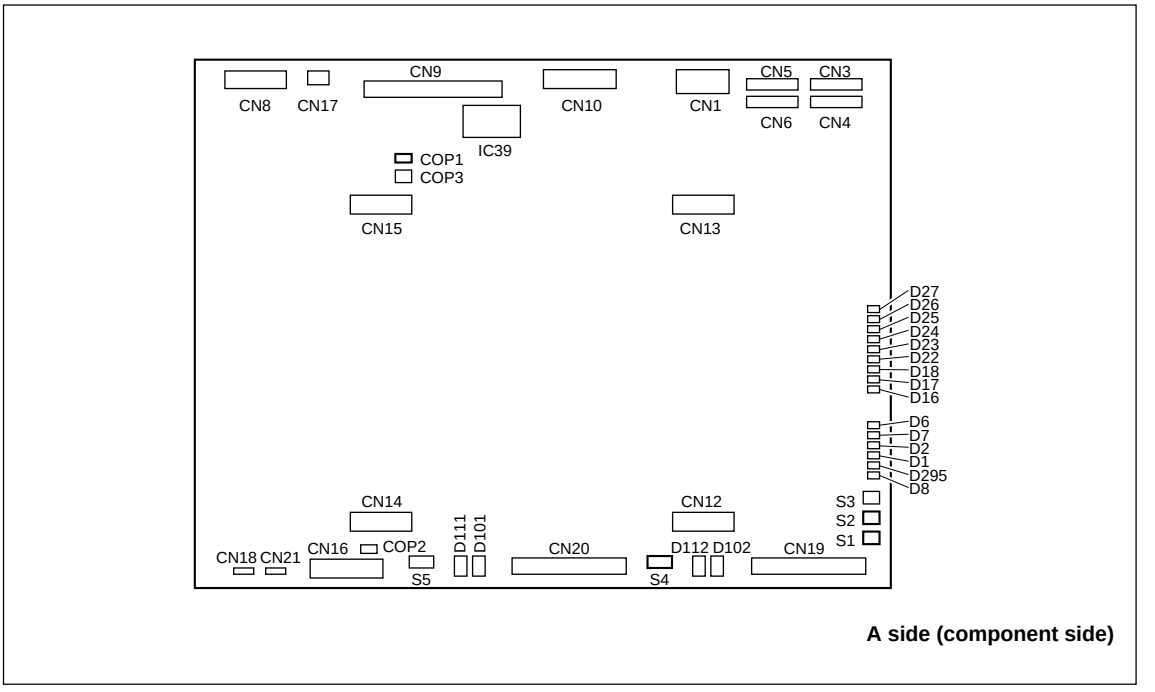
(1) "1. Memory test" Menu
Tests the peripheral memory of the main CPU and checks the memories function.
(2) "2. PIO test" Menu
Tests the PIO (IC67, IC70) and checks the PIO function.
(3) "3. GPI test" Menu
Tests the interface of the GPI connector on the connector panel of BKDS-7017 and checks the interface functions.
(4) "4. FDC test" Menu
Tests the floppy disk controller (FDC) and the floppy disk drive (FDD), checks the disk condition.
(5) "5. Timer & Interrupt test" Menu
Tests the CPU-246 board built-in timer and the interrupt controller, and checks their functions. For this test, HDS-7150/7100 is needed.
(6) "6. EL panel test" Menu
Tests the EL display and the control circuit, and checks the displayed contents.
(7) "7. And test" Menu
Checks the displayed contents on the alphanumeric display.
(8) "8. Communication test" Menu
Tests the communication of the communication ports and checks their functions.
(9) "9. Buzzer test" Menu
Checks that the buzzer sounds.
(10) "10. SUB CPU test" Menu
Tests the sub CPU which controls lighting of the LEDs, and which reads the switch data and volume control data. And checks the sub CPU functions.
(11) "11. MISC test" Menu
Used at the factory.

Use "Q. Quit" to exit the self diagnosis menu.

## 6-1-2. Description of Switches and LEDs on the CPU-246 Board

**Note**

The address on the board is shown in the parentheses.




**COP1** (E-3) :
This is used only for service and is opened under normal status.

**S1** (R-11) : RESET switch
This switch is used only for service. If pressed, the SYSTEM is reset and is restarted.

**S2** (R-11) : ABORT switch
This switch is used for the adjustment in the factory.

**S4** (K-11) : Main CPU select switch
Switch S4 sets the operation of the main CPU. After setting it, press the RESET switch or turn off the main power switch and turn it on again.

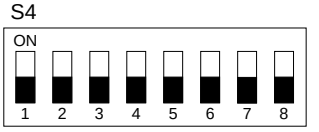
Default setting when shipped from the factory : All OFF

## For Starting Up of the Control Panels

BKDS-7017 can be update the operating software using the floppy disk.
The program that is loaded from the floppy disk is stored in the flash memory on the CPU-246 board.
By the selection of the switch S4, this unit is prepared the following three procedures for the starting up of the control panels.

### 1. Normal Mode

Under normal operation, start up the control panel in this mode.

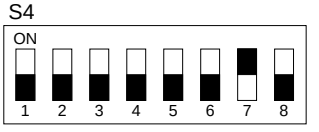



**Note**
■ indicates the knob position.

**Note**

Because this mode does not confirm the contents of the flash memory, a malfunction occurs when the program is not written in the flash memory and the contents of the flash memory are wrong.
If something is wrong, re-program to the flash memory referring to “2. Add-on Mode of Flash Memory Test” and “3. Request Mode of Down Load”.

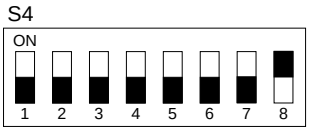
### 2. Add-on Mode of Flash Memory Test




**Note**
■ indicates the knob position.

This mode differs from the “1. Normal Mode”. This mode tests the contents of the flash memory, and carries out the main program only when the contents of the flash memory are correct.
If the program is not written in the flash memory or the contents of the flash memory are wrong, the menu that request to re-program is displayed.
After re-programming, set the select switch S4 to the setting of the “1. Normal Mode” and turn off/on the power again.

### 3. Request Mode of Down Load




**Note**

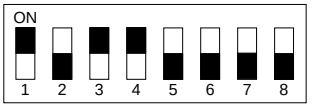
■ indicates the knob position.

Regardless of the contents of the flash memory, the menu that requests to re-program using the floppy disk is displayed.
The contents of the flash memory are tested in the “2. Add-on Mode of Flash Memory Test”, but a flash memory error passes the test in a low probability, and a malfunction may occur.

**Note**

When the control panel can not start up in both mode of the “1. Normal Mode” and “2. Add-on Mode of Flash Memory”, carry out this mode.
After re-programming, set the select switch S4 to the setting of the “1. Normal Mode” and turn off/on the power again.

## Test Mode Using a VT Terminal




**Note**
■ indicates the knob position.

If a VT terminal is connected to the “TERMINAL 1” connector on the connector panel, all trouble diagnosis of the unit can be carried out. For the connection and the contents of the test, refer to “6-1-4. Connecting the Test Terminal with Connector”.

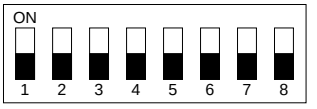
**S3** (R-10) : SUB ABORT switch
This switch is used for the adjustment in the factory. If pressing this switch after selecting the S5 switch on the CPU-246 board to the sub CPU flash memory access protection mode, erase the content of the flash memory for stored-program.

**S5** (F-11) : SUB CPU switch
This switch is used to select the operation mode of sub CPU.

Selections in the factory : All OFF

### 1. Selections when operating under normal status

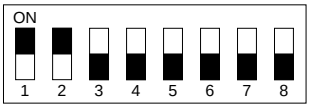
The selections for normal operation




**Note**
■ indicates the knob position.

### 2. Sub CPU Flash Memory Access Inhibit Mode

In this mode, the sub CPU runs using only the program stored in the ROM, regardless of the state of the flash memory. The sub CPU access to the flash memory is inhibited.




**Note**
■ indicates the knob position.

**D1** (Red color) (R-9) : RUN
Lights when the main CPU is operating.

**D2** (Red color) (R-9) : HALT
Lights when the main CPU is in the HALT state.

**D7** (Red color) (R-9) : M1
Lights when the reference signal is not transmitted from the HDS-7150.

**D8** (Red color) (R-9) : M0
Lights if the parameter read process is not executed with the HDS-7150.

**D16** (Red color) (R-7) : CH0
Blinks when the control signal from the HDS-7150 is received.

**D17** (Red color) (R-7) : CH1
Blinks when the control signal from the HDS-7150 is received.

**D18** (Red color) (R-7) : SIO0
This LED indicates the status of the CPU (IC86 on the CPU-246 board) which controls the SWITCHER port on the connector panel.
Lights off : The CPU is operating normally.
Lights : The CPU does not start up correctly.
Blinks : The dual port RAM (IC85 on the CPU-246 board), which is controlled by the CPU, is abnormal.

**D22** (Red color) (R-7) : CH4
Blinks when receiving the control signal from the equipment which is connected to the REMOTE 2 connector on the connector panel.

**D23** (Red color) (R-7) : CH5
Blinks receiving the control signal from the equipment which is connected to the REMOTE 3 connector on the connector panel.

**D24** (Red color) (R-7) : SI02
This LED indicates the status of the CPU (IC3 on the IF-523 board) which controls the two ports of REMOTE 2 and REMOTE 3 on the connector panel.
Lights off : The CPU is operating normally.
Lights : The CPU does not start up correctly.
Blinks : The dual port RAM (IC85 on the CPU-246 board), which is controlled by the CPU, is abnormal.

**D25** (Red color) (R-6) : CH6
Blinks when receiving the control signal from the equipment which is connected to the REMOTE 4 connector on the connector panel.

**D27** (Red color) (R-6) : SI03
This LED indicates the status of the CPU (IC7 on the IF-523 board) which controls the REMOTE 4 port on the connector panel.
Lights off : The CPU is operating normally.
Lights : The CPU does not start up correctly.
Blinks : The dual port RAM, which is controlled by the CPU, is abnormal.

**D101, D111** (P-1) : SUB
These LEDs are provided exclusively for maintenance service. They indicate the state of the sub CPU (IC142 on the CPU-246 board) which controls the LEDs and switches.

---

### Display Using the LED

The area surrounding the LED indicates the status of the reference signal supplied from the HDS-7150 which is connected to the SWITCHER connector of the connector panel.

- The area flashes in the clockwise direction around the LED :
  The reference signal is in the 1080 line mode.
- The area flashes in the counter-clockwise direction around the LED :
  The reference signal is in the 1035 line mode.
- All indicators on the surrounding area are lit :
  There is no reference signal. This might be because the HDS-7150 main power is not turned on, or the reference signal is not connected correctly.

### Other LED

These LEDs indicate the operation status of the sub CPU and the memory.

**D0** :
Lights : Flash memory (IC136 on the CPU-246 board) of the sub CPU is damaged.
Lights off : Flash memory (IC136 on the CPU-246 board) of the sub CPU is normal.

**D1** :
Lights : Flash memory (IC136 on the CPU-246 board) of the sub CPU is empty.
Lights off : Flash memory (IC136 on the CPU-246 board) of the sub CPU is normal.

**D2** :
Lights : The ROM (IC138 on the CPU-246 board), RAM (IC137 on the CPU-246 board), or dual port RAMs (IC134 or IC135 on the CPU-246 board) of the sub CPU is abnormal.
Light off : The ROM (IC138 on the CPU-246 board), RAM (IC137 on the CPU-246 board), and dual port RAMs (IC134 or IC135 on the CPU-246 board) of the sub CPU are normal.

**D3** :
This LED lights when the system is running in sub CPU flash memory access inhibit mode due to the S5 switch setting on the CPU-246 board.

**D102, D112** (M-12) :
These LEDs indicate the result of checking the operating condition of the main CPU.

**D295** (Green color) (R-9) : POWER (+5 V)
Lights when the power is supplied to the CPU-246 board.

**D8** (Green color) (R-9) : POWER (+12 V)
Lights when the power is supplied to the CPU-246 board.

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**TP1** (H-9) : CK40M
The 40 MHz square waves are visible when the system is operating normally.

**TP2** (H-9) : LCK40M
The 40 MHz square waves are visible when the system is operating normally. However, the waveform at this point has opposite polarity to that of TP1 on the CPU-246 board.

**TP3** (R-11) : RESET
The system reset signal is visible.

**TP4** (H-11) : AS
The AS signal which is generated by the main CPU (IC8 on the CPU-246 board) is visible.

**TP5** (H-11) : STERM
The STERM signal which is generated by the main CPU (IC8 on the CPU-246 board) is visible.

**TP6** (G-6) : DSACK0
The DSACK0 signal which is generated by the MDEC (IC10 on the CPU-246 board) is visible.

**TP7** (G-6) : DSACK1
The DSACK1 signal which is generated by the MDEC (IC10 on the CPU-246 board) is visible.

**TP8, TP9** (J-11) : M3, M2
Not used.

**TP10** (K-9) : VD
The vertical sync signal which is generated by the reference signal supplied from the HDS-7150 is visible. The sync signal of 16 ms rate is visible on the 1035 scanning lines. The sync signal of 20 ms rate is visible on the 1080 scanning lines.

**TP11** (K-9) : VDSNS
The “H” level appears when the reference signal from the HDS-7150 is received. The “L” level appears if the reference signal can not be received.

**TP12, TP13** (J-11) : S0, S1
Not used.

## 6-1-3. Tools and Equipment Required for Self Diagnosis

### 1. Test terminal with connector

Required for all test menus except “Communication test”.

(1) Terminal software
VT100 or VT100 equivalent

(2) Communication format
RS-232C

| | |
|---|---|
| Baud rate | 9600 bps |
| Data length | 8 bits |
| Parity | — |
| Stop bit | 1 bit |

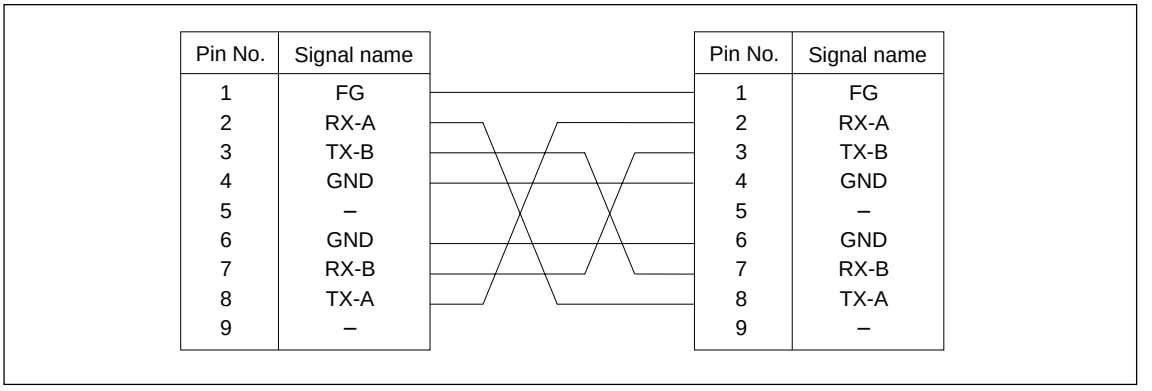
(3) Test connector to connect this unit
The pins-4 and -6 of the D-sub 9-pin male connector are shorted, and pins-7 and -8 of it are shorted.
(Refer to Section 6-1-4.)

## 2. Tool cable for testing communication system

Required for the “Communication test” menu.

(1) 4 tool cables for testing the RS-422A communication system

These tool cables are used to connect the “SWITCHER” and “DME” , “REMOTE 1” and “REMOTE 2” , “REMOTE 3” and “REMOTE 4” connectors on the connector panel. These tool cables which are shorted the two D-sub 9-pin male connectors as shown below.

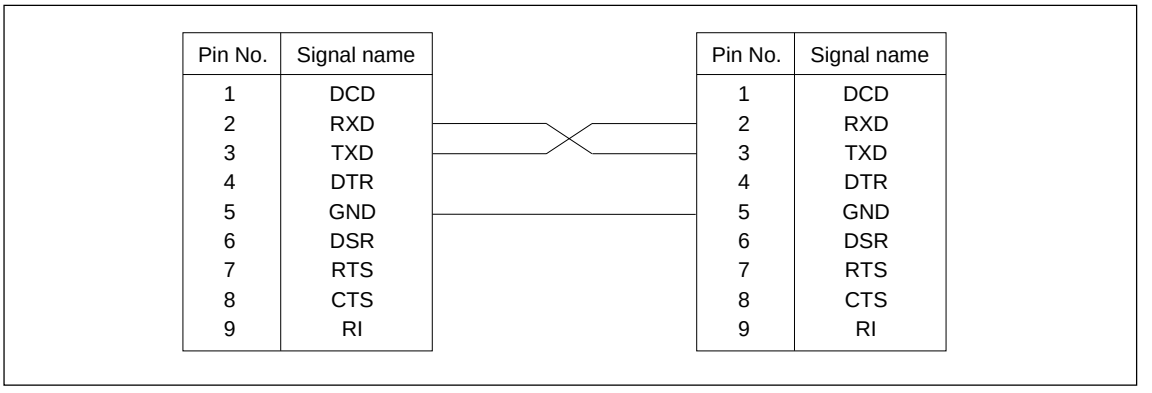


| Pin No. | Signal name |
|---|---|
| 1 | FG |
| 2 | RX-A |
| 3 | TX-B |
| 4 | GND |
| 5 | – |
| 6 | GND |
| 7 | RX-B |
| 8 | TX-A |
| 9 | – |

| Pin No. | Signal name |
|---|---|
| 1 | FG |
| 2 | RX-A |
| 3 | TX-B |
| 4 | GND |
| 5 | – |
| 6 | GND |
| 7 | RX-B |
| 8 | TX-A |
| 9 | – |

(2) 1 tool cable for testing the RS-232C communication system

This tool cable is used to connect the “TERMINAL 1” and “TERMINAL 2” connectors on the connector panel. This tool cables which are shorted the two D-sub 9-pin male connectors as shown below.



| Pin No. | Signal name |
|---|---|
| 1 | DCD |
| 2 | RXD |
| 3 | TXD |
| 4 | DTR |
| 5 | GND |
| 6 | DSR |
| 7 | RTS |
| 8 | CTS |
| 9 | RI |

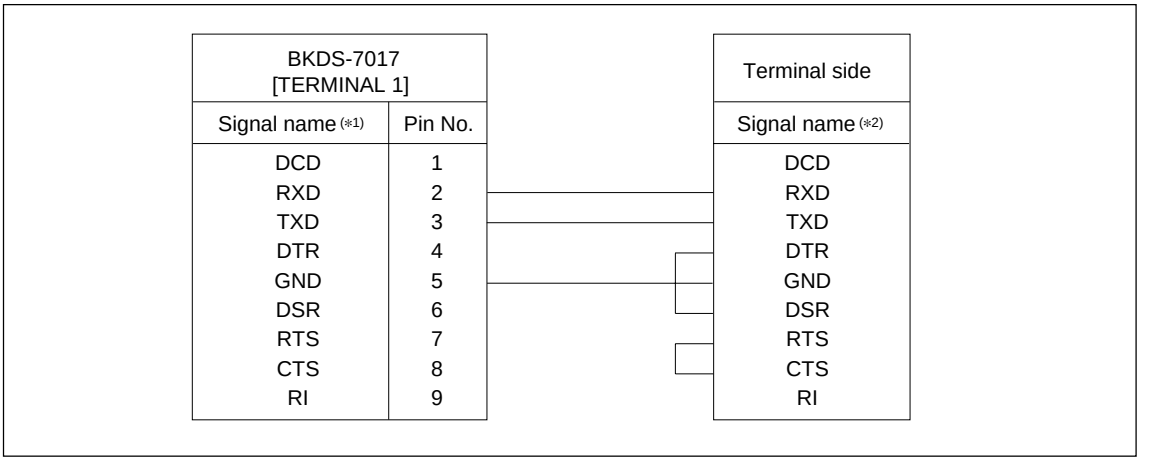
| Pin No. | Signal name |
|---|---|
| 1 | DCD |
| 2 | RXD |
| 3 | TXD |
| 4 | DTR |
| 5 | GND |
| 6 | DSR |
| 7 | RTS |
| 8 | CTS |
| 9 | RI |

## 3. HDS-7150

Required for “Timer & Int. test” menu.

## 6-1-4. Connecting the Test Terminal with Connector

Connect the terminal described in Section 6-1-3 to the “TERMINAL 1” D-sub 9-pin connector on the connector panel of the BKDS-7017.
For the connection, use the cable with satisfied the following specifications.

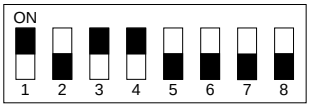



**Note**

The RXD (receiving data) and the TXD (sending data) of (∗1) are the sending and receiving signals from BKDS-7017. The RXD (receiving data) and the TXD (sending data) of (∗2) are the sending and receiving signals from the terminal. Therefore, the RXD of (∗1) is connected to the TXD of (∗2), and the TXD of (∗1) is connected to the RXD of (∗2).

## 6-1-5. Starting up the Self Diagnosis Mode

(1) Open the panel. (Refer to Section 2-1.)
(2) Turn off the power switch in the control panel.
(3) Connect the test terminal with connector. (Refer to Section 6-1-4.)
(4) Select the DIP switch (S4) on the CPU-246 board as shown below.




**Note**
■ indicates the knob position.

(5) Turn on the power switch in the control panel.
(6) Close the panel. (Refer to Section 2-1.)
(7) The following message is indicated on the terminal display.

```
      <MC68EC030 monitor V0.33 $Date: 1995/08/04 02:07:56 $
    COPYRIGHT (C) 1990,1992- SONY Corporation
  Help Support
    GDB & ECHO ON/OFF Support
>
```

**Note**
The date and the version of the test menu can be vary.

(8) Input “hwt” and press RETURN.

```
> hwt
```

(9) The terminal display is changed to the “H/W Tester on CPU-246” menu and the self diagnosis mode starts.

```
<<<<  H/W  Tester on CPU-246  >>>>

    1.  MEMORY
    2.  PIO
    3.  FDC
    4.  TIMER & INT
    5.  EL PANEL
    6.  AND
    7.  COMMUNICATION
    8.  BUZZER
    9.  SUB CPU
   10.  MISC
    Q.  Quit

   H/W Test = >
```

(10) Selecting the menu and executing the test
Select a menu item from the “H/W Tester on CPU-246” menu display. Input the menu item number and press RETURN.

(example)

```
H/W Test = > 1
```

(11) Exiting the “H/W Tester on CPU-246” menu
Input “Q” on the “H/W Tester on CPU-246” menu and press RETURN.

```
H/W Test = > Q
```

## 6-1-6. Test Procedures

### 1. Memory test

(1) After starting up the self diagnosis mode in Section 6-1-5, input the menu item number "1" on the "H/W Tester on CPU-246" menu and press RETURN.

```
H/W Test = > 1
```

Terminal display changes to the following "Memory test" display.

```
<<< MEMORY TEST >>>

    0.  RAM
    1.  DEBUG RAM
    2.  BACKUP RAM
    3.  VRAM(M)
    4.  VRAM(S)
    5.  DPR(SUB)
    6.  DPR(SIO0)
    7.  DPR(SIO2)
    8.  DPR(SIO3)
    9.  DPR(AND)
   10.  MAIN FLASH
   11.  FONT FLASH
   12.  DPR(ETHERNET OPTION)
   13.  DPR(SCSI OPTION)
    Q.  Quit

    Select Memory = >
```

Names of ICs on the CPU-246 board corresponding to each item of the "Memory test" display on the front page are shown below.

| Item | IC |
|---|---|
| 0. RAM | IC43 - 50 |
| 1. DEBUG RAM | For factory |
| 2. BACKUP RAM | IC39 |
| 3. VRAM (M) | IC93, 94 |
| 4. VRAM (S) | IC112, 113 |
| 5. DPR (SUB) | IC134, 135 |
| 6. DPR (SIO0) | IC85 |
| 7. DPR (SIO2) | IC1 (IF-523 board) |
| 8. DPR (SIO3) | IC6 (IF-523 board) |
| 9. DPR (AND) | IC123 |
| 10. MAIN FLASH | IC51, 52, 55, 56<br>IC59, 60, 63, 64 |
| 11. FONT FLASH | IC104 |
| 12. DPR (ETHERNET OPTION) | Reserved |
| 13. DPR (SCSI OPTION) | Reserved |

**Note**

The ICs of the above test items 2, 10, and 11 are stored the data if turning off the power. But if this test is performed, the memory contents are erased. The memory content of item 2 which are the setup information must be copied to a floppy disk before starting the test, and be down-loaded to the memory ICs after completing the test.

(2) Select a memory and perform the test as follows.
(example) Testing “RAM”
Input the item number “0” and press RETURN.

```
Select Memory = > 0
```

The memory test is automatically performed and the test result appeares on the terminal display.

```
     <<<  RAM CHECK  >>>

1. ADR BUS CHECK · · · ·
        OK
2. R/W DATA CHECK · · · ·
                                  0------25-----50-----75-----100
Address = [00A00000 -- 00B00000]  ********************  OK!

        Hit any key !
```

(3) Checking the test result
“OK” appears on each item of the selected memory test.

(example) “RAM” Test
“OK” appears on each item of “RAM CHECK” display.

(4) Exiting each item of memory test
Press any button on the terminal to return to the “Memory test” display.
(5) Exiting the “Memory test”
Input “Q” on the “Memory test” display and press RETURN.
The display returns to the “H/W Tester on CPU-246” menu.

```
Select Memory = > Q
```

## 2. PIO test

(1) After starting up the self diagnosis mode in Section 6-1-5, input the menu item number “2” on the “H/W Tester on CPU-246” menu and press RETURN.

```
H/W Test = > 2
```

Terminal display changes to the following “PIO test” display.

```
<<< PIO test >>>

    0.  Read
    1.  Write
    Q.  Quit

        Input test No. >
```

(2) Selecting and testing the “Read” test from the “PIO test”
Input the item number “0” on the “PIO test” display and press RETURN.

```
Input test No. > 0
```

The read test is automatically performed and the test result appears on the terminal display.

```
    <<< PIO DATA READ >>>
1.  STATUS  [PIO-1.reg B]
    SIO0  : L , SIO1  : L , SIO2  : L , SIO3  : L
    FIELD : L , FLDCNT : L , CENTRO : L , VDSNS : L
2.  DIP SW  [PIO-1.reg D]
    1: ON  2: OFF  3: ON  4: ON  5: OFF  6: OFF  7: OFF  8: OFF
3.  ERROR  [PIO-1.reg E]
    UNIT A : H  UNIT B : L *1

        Type any key !
```

**Note**

H : The power supply is normal, or the power supply unit is not installed.

L : The power supply is abnormal. (The power supply unit is faulty, the power supply fan is stopped, or the output voltage is greatly different from the set value.)

(3) Checking the test result
Check every test item of the “PIO data read”.
(a) “1. STATUS [PIO-1 reg B]” is the adjustment item at the factory.
(b) “2. DIP SW [PIO-1 reg D]”
The bits 1, 3, and 4 of the DIP switch (S4) on the CPU-246 board must be selected to “ON” and the other bits must be selected to “OFF”.

(4) “1. Write” for the adjustment item at the factory

(5) Exiting the “Read test”
Press any button on the terminal to return to the “PIO test” display.

(6) Exiting the “PIO test”
Input “Q” on the “PIO test” display and press RETURN.
The display returns to the “H/W Tester on CPU-246” menu.

```
Input test No. > Q
```

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### 3. FDC test

(1) After starting up the self diagnosis mode in Section 6-1-5, input the menu item number “3” on the “H/W Tester on CPU-246” menu and press RETURN.

```
H/W Test = > 3
```

Terminal display changes to the following “Floppy Disk drive/Controller (FDC)” display.

```
<<<  Floppy Disk drive/Controller test  >>>

     0.  Directory
     1.  Write protect
     2.  Seek              – – – use formated disk
     3.  Read & Write      – – – use formated disk
     4.  Format
     Q.  Exit

          Input test No. >
```

(2) Select an item from the “FDC test” and perform the test as follows.

**Notes**

- Items “2. Seek” and “3. Read & Write” of the “FDC test” menu require a formatted floppy disk.
- Items “3. Read & Write” and “4. Format” of the “FDC test” menu damage the stored contents of floppy disk.

(example) Testing “Directory”
Input the item number “0” on the “FDC test” display and press RETURN.

```
Input test No. > 0
```

The “FDC test” is automatically performed and the file names of the disk which is currently inserted in the FDD are displayed as shown below.

```
     <<  Directory test – – – Start  >>

a – rw  330833   '95 – 06 – 19   13:53   BKDS7010.WLZ
a – rw   68954   '95 – 06 – 19   13:56   FONT.WLZ
a – rw   11913   '95 – 06 – 19   14:02   SUB.WLZ

          Hit any key !
```

(3) Checking the test result
Check the following items on each test item of the “FDC test”.
(a) “0. Directory”
This test checks that the file names of the floppy disk which is currently inserted in the FDD.
(b) “1. Write protect”
This test checks that the write-protect status of the floppy disk.
(c) “2. Seek”
Check that “OK” appears on the “Seek” operation.
(d) “3. Read & Write”
Check that “OK” appears on the read and write operation of the FDD.
(e) “4. Format”
Check that “OK” appears on the formatting operation of the FDD.

(4) Exiting the test of the items of the FDC
Press any button on the terminal to return to the “FDC test” display.
(5) Exiting the “FDC test”
Input “Q” on the “FDC test” display and press RETURN.
The display returns to the “H/W Tester on CPU-246” menu.

```
Input test No. > Q
```

### 4. Timer & Interrupt test

This item tests the built-in timer and interrupt controller (IC76) on the CPU-246 board and checks their function correctly.

**Note**

This test requires HDS-7150.

(1) Connect the “SWITCHER PANEL” connector (D-sub 9-pin) on the rear panel of the HDS-7150 to the “SWITCHER” connector (D-sub 9-pin) on the connector panel of BKDS-7017.

(2) After starting up the self diagnosis mode in Section 6-1-5, input the menu item number “4” on the “H/W Tester on CPU-246” menu and press RETURN.

```
H/W Test = > 4
```

The Timer & Interrupt test is automatically performed and the test result appears on the terminal display.

```
      <<<  TIMER & INTERRUPT TEST  >>>

1.  TIMER 0 & INT  : OK ! *1
2.  TIMER 1 & INT  : OK ! *1
3.  TIMER 2 & INT  : OK ! *1
4.  VD INT         : OK ! *1

    Hit any key to quit !
```

**Note**

OK ! : Normal

(3) Checking the test result
Check that “OK” appears on each item of the Timer & Interrupt test.

(4) Exiting the “Timer & Interrupt test”
Press any button on the terminal to return to the “H/W Tester on CPU-246” menu.

### 5. EL panel test

(1) After starting up the self diagnosis mode in Section 6-1-5, input the menu item number “5” on the “H/W Tester on CPU-246” menu and press [RETURN].

```
H/W Test = > 5
```

Terminal display changes to the following “EL test” display.

```
<<< EL test >>>

  1. Main screen crosshatch test.
       Hit any key !
  2. Main screen character test.
       Hit any key !
  3. Main screen scroll test.
       Hit any key !
  4. Main screen reverse test.
       Hit any key !
  5. Main screen blink test.
       Hit any key !
  6. Sub screen crosshatch test.
       Hit any key !
  7. Sub screen character test.
       Hit any key !
  8. Sub screen scroll test.
       Hit any key !
  9. Sub screen over test.
       Hit any key !
 10. Sub screen OR test.
       Hit any key !
 11. All clear.
       Hit any key !
 12. All light.
       Hit any key !
 13. EL disable test.
       Hit any key !
```

(2) Selecting a menu item from the “EL test” and executing the test
Press any button on the terminal. Content of the item 1 of the “EL test” menu appears on the EL display. Every time any button on the terminal is pressed, the item of the “EL test” is performed.

(3) Checking the test result

Check the followings on each item of the “EL test”.

- The character font of the main screen uses the flash memory.
- The character font of the sub screen uses the ROM.

(a) “1. Main screen crosshatch test”

Check that the vertical and horizontal lines of the crosshatch pattern do not bend or disappear.

**Note**

If there is any non-programmed memory, all elements of the EL display light.

(b) “2. Main screen character test”

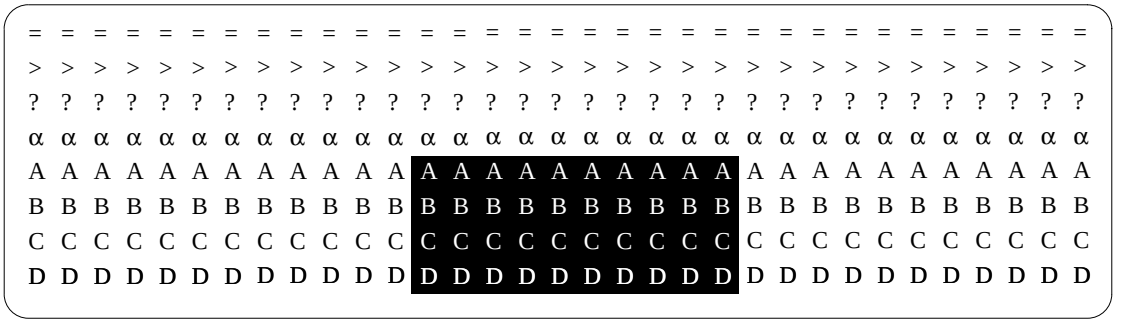
Check that the alphanumeric characters are indicated.

(c) “3. Main screen scroll test”

Check that the alphanumeric character display of the item (b) scrolls in the vertical direction.

(d) “4. Main screen reverse test”

Check that the alphanumeric character display of the item (b) is partially highlighted in blocks.




(e) “5. Main screen blink test”

Check that the partially highlighted portions of the item (d) blink.

(f) “6. Sub screen crosshatch test”

Check that the vertical and horizontal lines of the crosshatch pattern do not bend or disappear.

(g) “7. Sub screen character test”

Check that the alphanumeric characters are indicated.

(h) “8. Sub screen scroll test”

Check that the alphanumeric character display of the item (g) scrolls in the vertical direction.

(i) “9. Sub screen over test”

Check that the alphanumeric characters “S” are displayed in the alphanumeric characters “M” in blocks.

(j) “10. Sub screen OR test”

Check that the alphanumeric characters “S” are displayed on the half-tone background.

(k) “11. All clear”

Check that all elements of the EL display light off.

(l) “12. All light”

Check that all elements of the EL display light.

(m) “13. EL disable test”

Check that all elements of the EL display light off.

(4) Exiting the “EL test”

Press any button on the terminal to return to the “H/W Tester on CPU-246” menu.

## 6. AND test

This menu tests the alphanumeric display.

(1) After starting up the self diagnosis mode in Section 6-1-5, input the menu item number “6” on the “H/W Tester on CPU-246” menu and press RETURN.

```
H/W Test = > 6
```

The terminal screen changes to the following “AND test” display.

```
<<< AND test >>>

  1. Fill AND MEMORY with W.
       Hit any key !

  2. Fill AND MEMORY with M.
       Hit any key !

  3. Fill AND MEMORY with BLANK.
       Hit any key !

  4. Fill AND MEMORY with FULL.
       Hit any key !

  5. Lum level = 3
       Hit any key !

  6. Lum level = 2
       Hit any key !

  7. Lum level = 1
       Hit any key !

  8. Lum level = 0
       Hit any key !
```

(2) Selecting a menu item from the “AND test” and executing the test
Press any button on the terminal. The “AND test” item 1 is performed. Press any button on the terminal again. The “AND test” item 2 is performed. All contents of the test items appear on the alphanumeric display.

(3) Checking the test result

Check the followings on each item of the “AND test”.

(a) “1. Fill AND MEMORY with W.”
Check that all alphanumeric displays are filled with the letter “W”.

(b) “2. Fill AND MEMORY with M.”
Check that all alphanumeric displays are filled with the letter “M”.

(c) “3. Fill AND MEMORY with BLANK.”
Check that all alphanumeric displays light off.

(d) “4. Fill AND MEMORY with FULL.”
Check that all dots of all alphanumeric displays light up.

(e) “5. Lum level = 3”
Check that it is possible to adjust the brightness level 3 mode (the 1st brightness).

(f) “6. Lum level = 2”
Check that it is possible to adjust the brightness level 2 mode (the 2nd brightness).

(g) “7. Lum level = 1”
Check that it is possible to adjust the brightness level 1 mode (the 2nd darkness).

(h) “8. Lum level = 0”
Check that it is possible to adjust the brightness level 0 mode (the 1st darkness).

(4) Exiting the “AND test”

Press any button on the terminal to return to the “H/W Tester on CPU-246” menu.

### 7. Communication test

(1) Connect the four tool cables for testing the RS-422A communication system and the tool cable for testing the RS-232C communication system in Section 6-1-3 to the following D-sub 9-pin connectors.

(a) Tool cables for testing the RS-422A communication system
- Between “SWITCHER” and “DME” connectors
- Between “REMOTE 1” and “REMOTE 2” connectors
- Between “REMOTE 3” and “REMOTE 4” connectors

(b) Tool cable for testing the RS-232C communication system
- Between “TERMINAL 1” and “TERMINAL 2” connectors

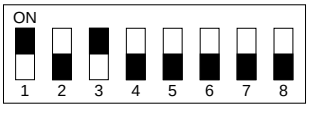
**Note**

Checking the IF-523 board
The IF-523 board is necessary to test the communication state between the “REMOTE 3” and the “REMOTE 4” connectors as described in item (f) of step (9), and to initialize SIO2 and SIO3 as described in items (b) and (c) of step (9).

**Note**

The tool cable for testing the RS-232C communication system is connected between “TERMINAL 1” and “TERMINAL 2” connectors in this test. Therefore, the terminal with connector cannot be used. Perform this test in the following procedures.

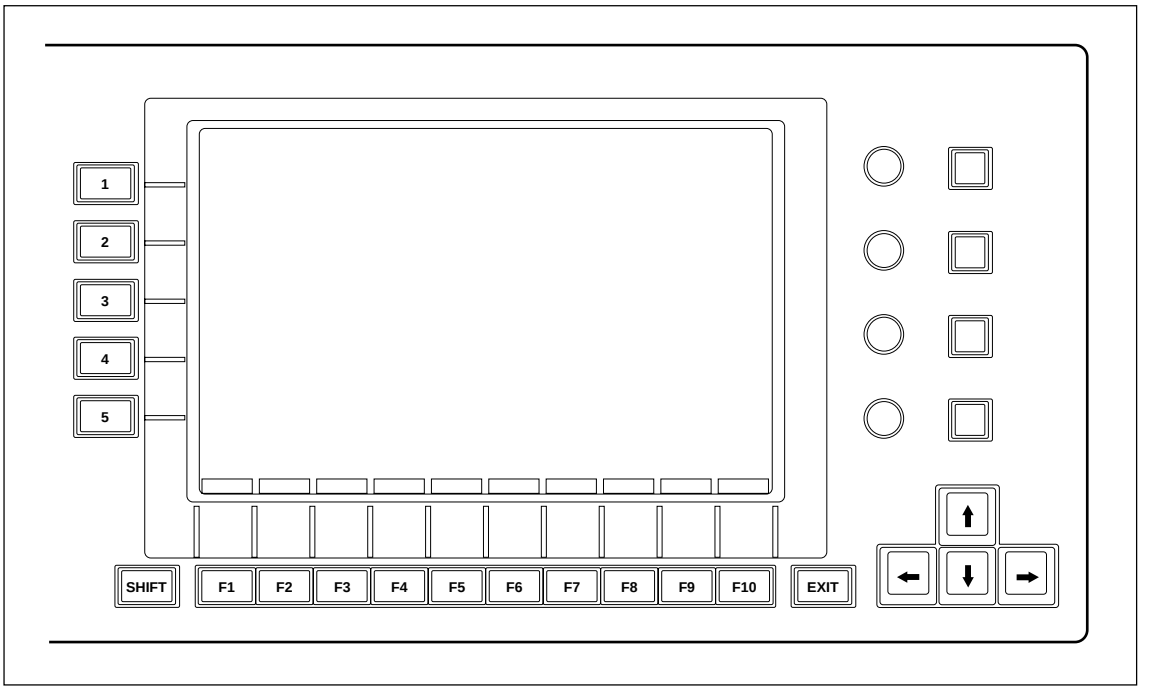
(2) Open the panel. (Refer to Section 2-1.)
(3) Turn off the power switch in the control panel.
(4) Set the DIP switch (S4) on the CPU-246 board as shown below.




**Note**
■ indicates the knob position.

(5) Turn on the power switch in the control panel.
(6) Close the panel. (Refer to Section 2-1.)

(7) Press the [1] button on the display panel. The "H/W Tester on CPU-246" menu appears on the EL display. The peripheral buttons of the EL display are shown below.




(8) Selecting "Communication test" menu item and executing the test
Press [F7] on the display panel to input "7" on the "H/W Tester on CPU-246" menu display, and then press the [EXIT] button on the display panel.

**Notes**

- To input a number, press [F1] through [F10] button on the display. The buttons [F1] through [F10] correspond to the numbers 1 through 10.
- The [EXIT] button has the function of the [RETURN].

```
H/W Test = > 7
```

The communication test is automatically performed and the test result is shown on the EL display as follows.

```
<<< COMMUNICATION TEST >>>

  Reset sio0             :OK
  Reset sio2             :OK
  Reset sio3             :OK
  Reset sio4 (sub cpu)   :OK

  sio0 ch0[controlling] <-> ch1[controlled] :OK
  sio0 ch1[controlling] <-> ch0[controlled] :OK

  sio2 ch0[controlling] <-> ch1[controlled] :OK
  sio2 ch1[controlling] <-> ch0[controlled] :OK

  sio3 ch0[controlling] <-> ch1[controlled] :OK
  sio3 ch1[controlling] <-> ch0[controlled] :OK

  sio4 ch0[controlling] <-> ch1[controlled] :OK
  sio4 ch1[controlling] <-> ch0[controlled] :OK
```

(9) Checking the test result
Check that “OK” appears on each item of the communication test.
(a) “Reset sio0”
Indicates initialization status of SIO0.
(b) “Reset sio2”
Indicates initialization status of SIO2 (IC3 on the IF-523 board).
(c) “Reset sio3”
Indicates initialization status of SIO3 (IC7 on the IF-523 board).
(d) “Reset sio4 sub cpu”
Indicates initialization status of sub CPU.
(e) “sio0 ch0 [controlling] <-> ch1 [controlled]
sio0 ch1 [controlling] <-> ch0 [controlled]”
Indicates communication status between “SWITCHER” and “DME” connectors.
(f) “sio2 ch0 [controlling] <-> ch1 [controlled]
sio2 ch1 [controlling] <-> ch0 [controlled]”
Indicates communication status between “REMOTE 3” and “REMOTE 4” connectors.
(g) “sio4 ch0 [controlling] <-> ch1 [controlled]
sio4 ch1 [controlling] <-> ch0 [controlled]”
Indicates communication status between “TERMINAL 1” and “TERMINAL 2” connectors.

(10) Exiting the “Communication test”
Press the [EXIT] button on the display panel to return to the “H/W Tester on CPU-246” menu.

(11) Remove all tool cables for communication tests from the connector panel and connect the terminal with connector to the “TERMINAL 1” connector. (Refer to Section 6-1-4.)

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## 8. Buzzer test

Checks that the buzzer sounds.

(1) After starting up the self diagnosis mode in Section 6-1-5, input the menu item number “8” on the “H/W Tester on CPU-246” menu and press RETURN.

```
H/W Test = > 8
```

The terminal screen changes to the following display and buzzer sounds intermittently.

```
<<< BUZZER Test >>>

    NOW TESTING ! !

                    Q,ESC - > EXIT
```

(2) Checking the test result
Check that buzzer sounds intermittently.

(3) Exiting the “Buzzer test”
Press “Q” or “ESC” button on the terminal to return to the “H/W Tester on CPU-246” menu.

### 9. SUB CPU test

The sub CPU on the CPU-246 board controls the lighting of the LEDs and reads the switch data and volume control data. In this test, the sub CPU for the KY-318 through KY-324 boards is tested.

(1) After starting up the self diagnosis mode in Section 6-1-5, input the menu item number “9” on the “H/W Tester on CPU-246” menu and press [RETURN].

```
H/W Test = > 9
```

The terminal screen changes to the following “SUB CPU test” display.

```
<<<<<<<<<<<  SUB CPU Test  >>>>>>>>>>>
          – – – – – Test Menu – – – – –
     1 :   SW SCAN Test
     2 :   LED LIGHTING Test
     3 :   7SEG LED Test
     4 :   FADER & JOY STICK Test
     5 :   VOLUME KNOB Test
     6 :   LED BRIGHTNESS Test
     Q :   Exit

          Input Test No ! (1-6) or  Q"
```

(2) Select a menu item from the “SUB CPU test” and execute the test.

(example) Testing “1 : SW SCAN test”
Press “1” on the terminal.
The “1 : SW SCAN test” is automatically performed.

(3) Checking the test result
Check the followings on each test item.
   (a) “1 : SW SCAN test”
   Press a button on the control panel and check that the pressed button lights.
   For the two-color lighting buttons, press the button again and check that the second color lights.
   (b) “2 : LED LIGHTING test”
   Check that all buttons on the control panel light each block and each board.
   (c) “3 : 7-SEG LED test”
   Check that all elements for the numeric display 7-segment LED on the control panel light.
   (d) “4 : FADER & JOY STICK test”
   Check that the current value of the fader lever and the joy stick is displayed on the EL display.
   (d) “5 : VOLUME KNOB test”
   Check that the current value of the volume knob is displayed on the EL display.
   (f) “6 : LED BRIGHTNESS test”
   Check that the buttons in each block on the control panel are the same in color and brightness.

(4) Exiting the “SUB CPU test”
Press “Q” button on the terminal to return to the “H/W Tester on CPU-246” menu.

## 6-1-7. Exiting the Self Diagnosis Mode

(1) Open the panel. (Refer to Section 2-1.)
(2) Turn off the power switch in the control panel.
(3) Set the DIP switch (S4) on the CPU-246 board to OFF. (Operation mode)
(4) Turn on the power switch in the control panel.
(5) Close the panel. (Refer to Section 2-1.)

## 6-2. Self Diagnostics of BKDS-2010 Using Terminal

By connecting the following terminal, BKDS-2010 is able to check all its function.

### Communication Format

RS-232C

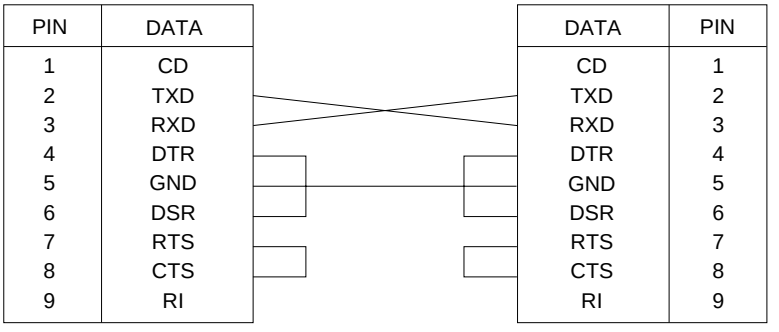
| | |
|---|---|
| Baud rate | 9600 |
| Data length | 8 bits |
| Parity | None |
| Stop bit | 1 |

### Checks

1. SW SCAN TEST
2. LED TEST
3. BRIGHT TEST
4. 7SEG TEST
5. VOLUME TEST
6. LCD TEST
7. BUZZER TEST
8. MEMORY TEST
9. COMM TEST

### 6-2-1. Connecting Terminal

Connect the terminal to the TERMINAL connector (9-pin) at the rear panel of BKDS-2010.



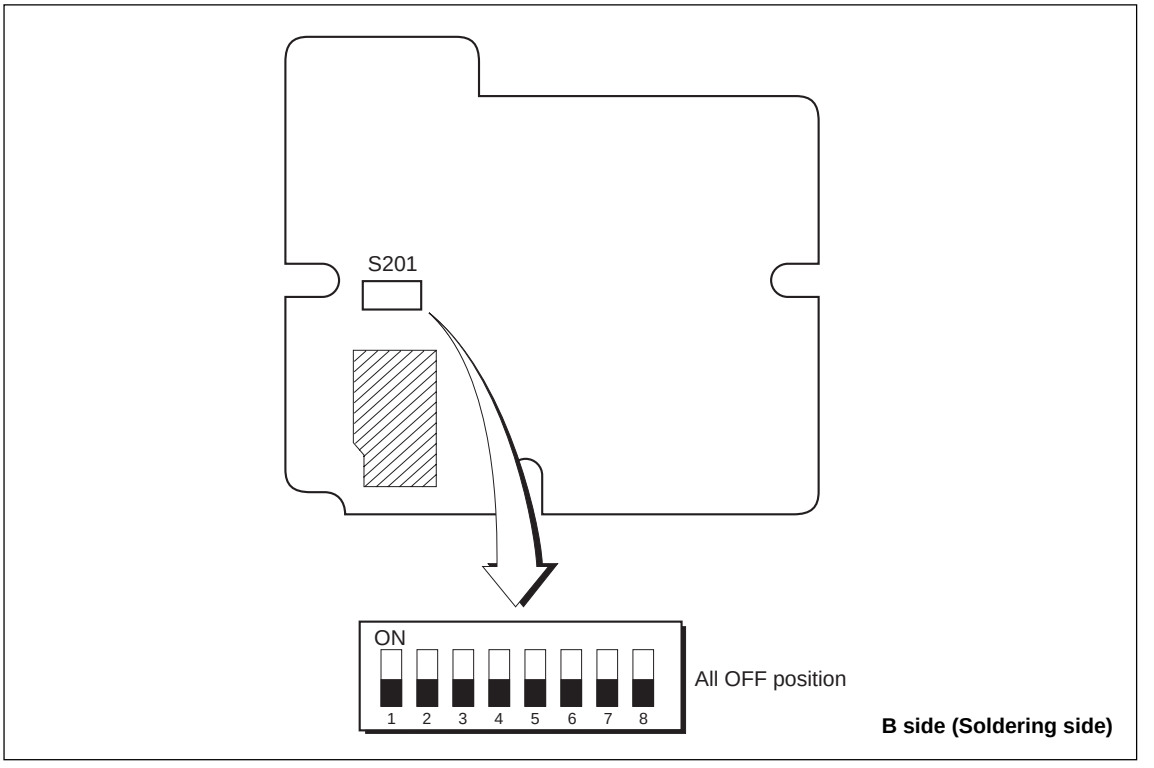

**Notes**

- Pins 1 and 9 are not connected inside the unit. Pins 4 and 6, and pins 7 and 8 are short-circuited inside. Therefore, if pins 2, 3, and 5 are connected, communication can be carried out.
- RXD (reception data) and TXD (transmission data) mean reception and transmission respectively for BKDS-2010. Therefore, connect TXD of the terminal to RXD of BKDS-2010, and RXD of the terminal to TXD of BKDS-2010.

## 6-2-2. Starting Up Self Diagnosis Mode

(1) Check that the AC inlet is disconnected from the rear panel of the BKDS-2010.
(2) Connect the terminal and starting it up.
(3) Set the DIP switch S201 (B-6) on the KY-307 board as follows.
(4) While pressing the POS ON button, connect the AC inlet to the rear panel of the BKDS-2010.
The test menu is shown on the display of the terminal.

### KY-307 Board




**Note**

■ indicates the knob position.

## 6-2-3. Self Diagnosis

(1) Enter the self diagnosis mode according to the procedure in Section 6-2-2.
The following menu is shown on the display of the terminal.
(2) Input the desired number from the terminal, and the test starts.

```
-- BKDS-2010 TEST PROGRAM --

1. SW SCAN TEST
2. LED TEST
3. BRIGHT TEST
4. 7SEG TEST
5. VOLUME TEST
6. LCD TEST
7. BUZZER TEST
8. MEMORY TEST
9. COMM TEST

INPUT NO. :
```

The details of each test is as follows.

### 1. SW SCAN TEST

Checks whether the switch scan of BKDS-2010 is operating properly.

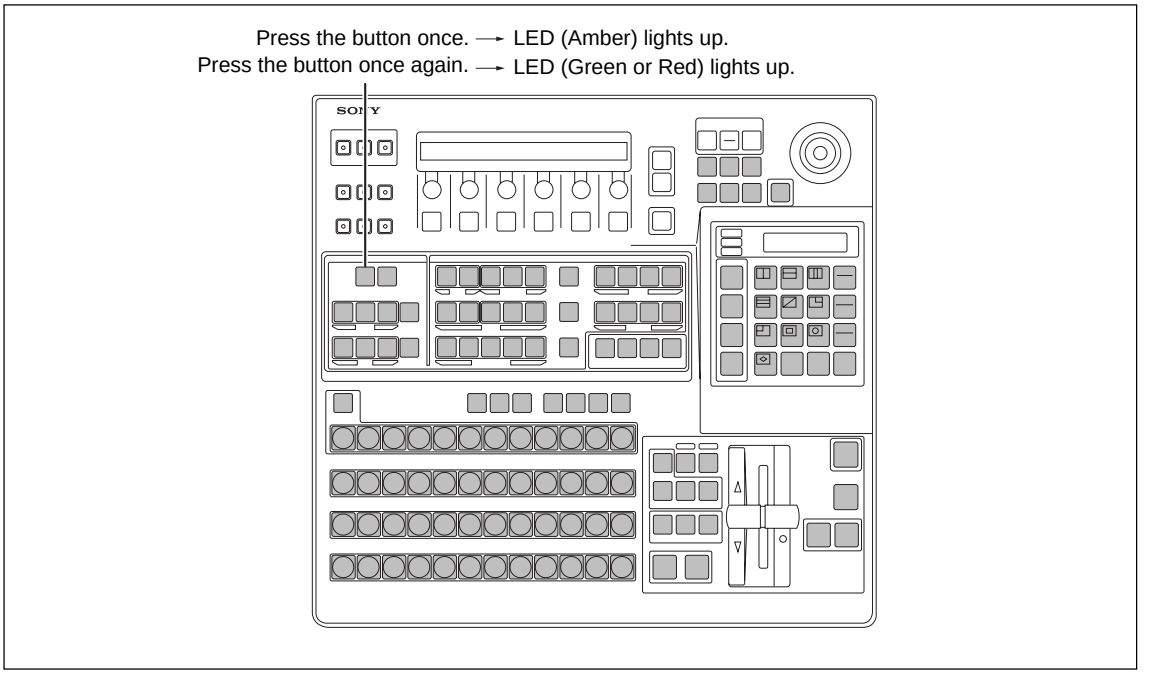
#### Procedure

(1) Enter the self diagnosis mode according to the procedure in Section 6-2-2.
The menu is shown on the display.
(2) Input “1” to enter the SW SCAN TEST mode.
The following SW SCAN TEST display is shown.

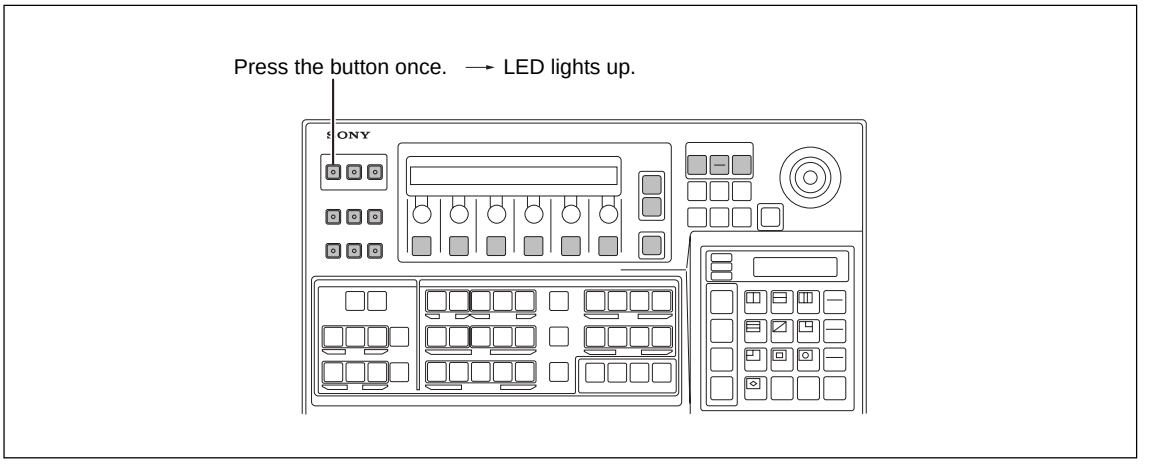
```
[ SW SCAN TEST ]

Q : QUIT
```

(3) Press a button, and check that the LED of that button lights and the LEDs of other buttons light off.
As described below, LEDs light up according to the button.

- Two-color lighting buttons
  When the button is pressed, the first color lights up.
  When pressed that button once more, the second color lights up.




- One-color lighting buttons
  When the button is pressed, the LED lights up.




(4) To exit the SW SCAN TEST mode, input [Q].

## 2. LED TEST

Checks whether each LED lights up properly.

### Procedure

(1) Enter the self diagnosis mode according to the procedure in Section 6-2-2.
The menu is shown on the display of the terminal.
If continued from other test, proceed to step (2).

(2) Input "2" to enter the LED TEST mode.
The following LED TEST display is shown.

```
[ LED TEST ]

1. KY-306
2. KY-307
3. KY-308
4. KY-291

Q : QUIT

INPUT NO. :
```

(3) Input the number of the board to be tested.
The following menu is shown and the LEDs light up in order.

```
[ LED TEST for KY-XXX ]

Q : QUIT
```

The following menu is shown when the KY-307 board is selected.

```
[ LED TEST for KY-307 ]

F  : FORWARD
B : BACKWARD
Q : QUIT
```

The LEDs on the KY-307 board are divided into several groups and light up in groups.
Input "F" to light up the next group and input "B" to light up the previous group.

(4) To exit the LED TEST mode, input "Q" once to return to the display at step (2), and input "Q" again.

### 3. BRIGHT TEST

Checks that the all LEDs is the same in brightness.

#### Procedure

(1) Enter the self diagnosis mode according to the procedure in Section 6-2-2.
The menu is shown on the display.
If continued from other test, proceed to step (2).

(2) Input "3" to enter the BRIGHT TEST mode.
The following BRIGHT TEST display is shown.

```
[ LED BRIGHTNESS TEST ]

1. KY-306
2. KY-307
3. KY-308
4. KY-291

Q : QUIT
INPUT NO. :
```

(3) Input the number of the board to be tested.
The following menu is shown.

```
[ LED BRIGHTNESS TEST for KY-XXX ]

F : FORWARD
B : BACKWARD
Q : QUIT
```

(4) All the LEDs of the selected board light up together.
Input "F" or "B" to change the color for the two-color lighting buttons. (For the details of the one-color or two-color lighting buttons, refer to step (3) in "1. SW SCAN TEST'.)

(5) To exit the BRIGHT TEST mode, input "Q"once to return to the display at step (2), and input "Q" again.

### 4. 7SEG LED TEST

Checks whether the 7-segment LEDs are displayed properly.

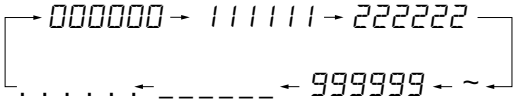
#### Procedure

(1) Enter the self diagnosis mode according to the procedure in Section 6-2-2.
The menu is shown on the display of the terminal.
If continued from other test, proceed to step (2).

(2) Input "4" to enter the 7SEG LED TEST mode.
The following 7SEG LED TEST display is shown.

```
[ 7SEG TEST ]

Q : QUIT
```

(3) Check that the 7-segment LEDs light up in the following order.




(4) To exit the 7SEG LED TEST mode, input "Q".

### 5. VOLUME TEST

Checks whether the fader, volume controls (rotary encoders), and positioner are operating properly.

#### Procedure

(1) Enter the self diagnosis mode according to the procedure in Section 6-2-2.
The menu is shown on the display of the terminal.
If continued from other test, proceed to step (2).

(2) Input "5" to enter the VOLUME TEST mode.
The following VOLUME TEST display is shown.

```
[ FADER, VOLUME, POSITIONER TEST ]

Q : QUIT
```

(3) Operate the fader, volume controls, and positioner.
Data on these is shown in hexadecimal digits on the display. The LED of the bus control keys lights up corresponding to the changes of the values.

FADER : The current value is shown on the Liquid Crystal Display of BKDS-2010 and shown by the PGM BUS and PST BUS LEDs. The first 3 bits from MSB are shown by the PGM BUS, and the next 3 bits are shown by the PST BUS. Each 3-bit data is decoded, assigned to switches 0 to 7, and displayed by the lighting of the LEDs. The values shown on the display are absolute values.

VOLUME : Displayed in the same way as for the FADER.

POSITIONER : For the X axis direction, the 3-bit date from the MSB is indicated by the AUX BUS. For the Y axis, the 3-bit data from the MSB is indicated by the KEY BUS.

(4) To exit the VOLUME TEST mode, input "Q".

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## 6. LCD TEST

Checks whether the Liquid Crystal Display of the BKDS-2010 shows properly.

### Procedure

(1) Enter the self diagnosis mode according to the procedure in Section 6-2-2.
The menu is shown on the display of the terminal.
If continued from other test, proceed to step (2).

(2) Input “6” to enter the LCD TEST mode.
The following LCD TEST display is shown.

```
[ LCD TEST ]

Q : QUIT
```

(3) Check that all the letters of A through Z are shown on the Liquid Crystal Display of the BKDS-2010.

(4) To exit the LCD TEST mode, input “Q”.

## 7. BUZZER TEST

Checks whether the buzzer sounds.

### Procedure

(1) Enter the self diagnosis mode according to the procedure in Section 6-2-2.
The menu is shown on the display of the terminal.
If continued from other test, proceed to step (2).

(2) Input “7” to enter the BUZZER TEST mode.
The following BUZZER TEST display is shown.

```
[ BUZZER TEST ]

Q : QUIT
```

(3) Check that the buzzer sounds.
The buzzer continues sounding until “Q” is input.

(4) To exit the BUZZER TEST mode, input “Q”.

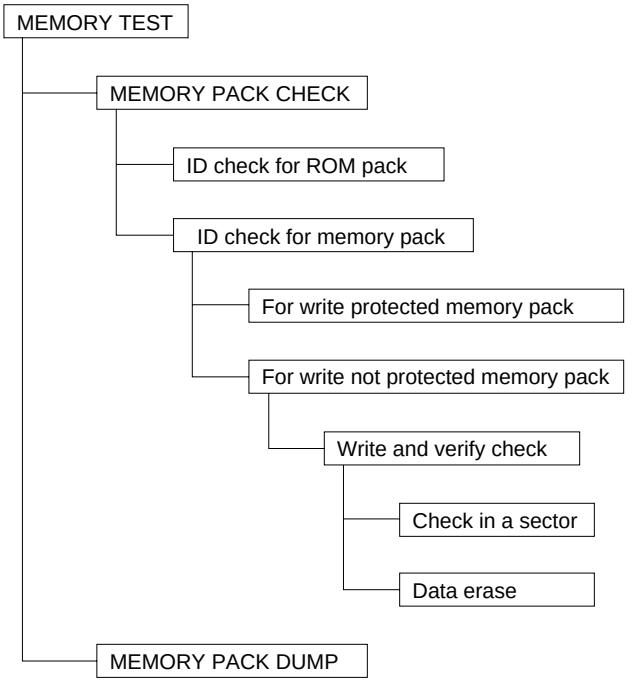
## 8. MEMORY TEST

Checks the data, connection, and memory dump in the memory pack.

**Note**

When the memory pack check in the MEMORY TEST is carried out, the data in the pack is erased. Therefore, not use the written memory pack in this test.

The following items can be tested in this mode.




### Procedure

(1) Enter the self diagnosis mode according to the procedure in Section 6-2-2.
The menu is shown on the display of the terminal.
If continued from other test, proceed to step (2).

(2) Input “8” to enter the MEMORY TEST mode.
The following MEMORY TEST display is shown.

```
[ MEMORY TEST ]

1. MEMORY PACK CHECK
2. MEMORY PACK DUMP

Q : QUIT
```

## MEMORY PACK CHECK

Checks the data and connection in the memory pack.
This test's operation changes by setting (protected or not protected) and kind of the memory pack (ROM pack or memory pack). (Refer to item list on page 6-40.)

### ROM PACK

Checks ID data of the header.

### Procedure

(1) Enter the MEMORY TEST mode in according to steps (1) and (2) of “8. MEMORY TEST”.
(2) Input “1” to enter the MEMORY PACK CHECK mode.
The following MEMORY PACK CHECK display is shown at regular intervals on the display of the terminal.
The header data of the memory pack is shown .
The header has the data of ID code, label, version, and the start address and length of software for the control panel and processor.

```
[ MEMORY CHECK TEST ]

Q : QUIT

ROM PACK
BZS-2610
Ver. 1.00

PANEL START : 100
LENGTH : 21820

PROC START : 0
LENGTH : 0
```

**ID data is OK**

```
[ MEMORY CHECK TEST ]

Q : QUIT

ROM PACK
ID ERROR : FFFF

PANEL START : 100
LENGTH : 21820

PROC START : 0
LENGTH : 0
```

**ID data is NG**

**Note**
This is the case that ID data is FFFFH.

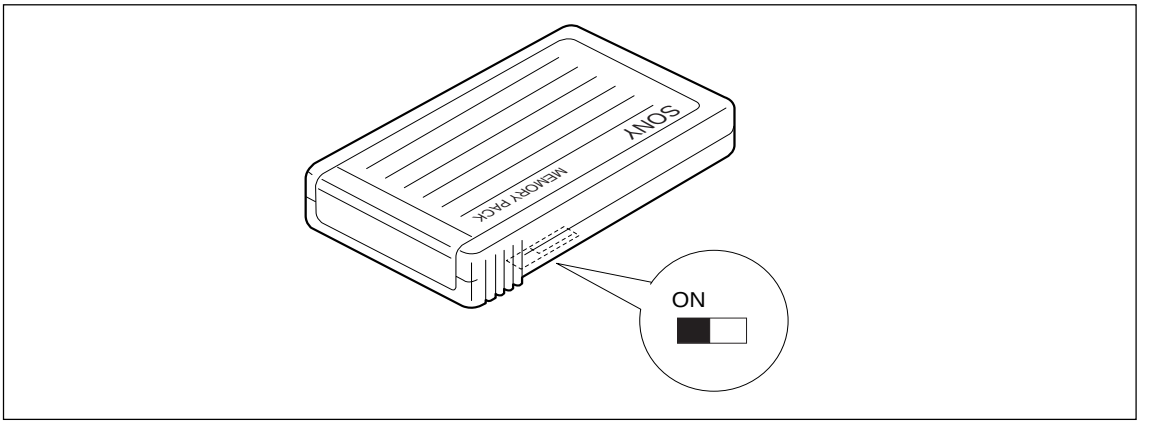
(3) To exit the MEMORY PACK CHECK mode, input “Q” once to return to the display at step (2) of “8. MEMORY TEST”, and input “Q” again.

### MEMORY PACK

The write protected memory pack or write not protected memory pack is used for the MEMORY PACK CHECK.
When the protect switch is set to ON, that memory pack cannot write the data.
When the write protect switch is set to OFF, that memory pack can write the data.

**Note**

In this memory pack check, the data in the pack is erased. Therefore, not use the written memory pack in this test.




#### ① The case of write protected memory pack

Checks that the control panel can receive information of the write protected condition.

#### Procedure

(1) Enter the MEMORY PACK TEST mode in according to steps (1) and (2) of “8. MEMORY TEST”.
(2) Input “1” to enter the MEMORY PACK CHECK mode.
The following MEMORY PACK CHECK display is shown on the display of the terminal.

```
[ MEMORY CHECK TEST ]

Q : QUIT

MEMORY PACK (PROTECTED)
```

(3) To exit the MEMORY PACK CHECK mode, input “Q” once to return to the display at step (2) of “8. MEMORY TEST”, and input “Q” again.

### ② The case of write not protected memory pack

#### Procedure

(1) Enter the MEMORY TEST mode in according to steps (1) and (2) of “8. MEMORY TEST”.

(2) Input “1” to enter the MEMORY PACK CHECK mode.
The following MEMORY PACK CHECK display is shown on the display of the terminal.

```
[ MEMORY CHECK TEST ]

Q : QUIT

MEMORY PACK
```

(3) If use the write not protected memory pack, writing and checking the verify are carried out automatically. And the following display is shown at regular intervals.
The memory pack has eight sectors and the memory pack is checked in a sector.

```
SECTOR ERASE  : 0
WRITE & READ  : 0

SECTOR ERASE  : 1
WRITE & READ  : 1

SECTOR ERASE  : 2
WRITE & READ  : 2

SECTOR ERASE  : 3
WRITE & READ  : 3

SECTOR ERASE  : 4
WRITE & READ  : 4

SECTOR ERASE  : 5
WRITE & READ  : 5

SECTOR ERASE  : 6
WRITE & READ  : 6

SECTOR ERASE  : 7
WRITE & READ  : 7
```

(4) The following display is shown on the display of the terminal and the data in the memory pack is erased automatically.

```
ERASE ALL DATAS

MEMORY PACK CHECK OK !
```

(5) To exit the MEMORY PACK CHECK mode, input “Q” once to return to the display at step (2) of “8. MEMORY TEST”, and input “Q” again.

## MEMORY PACK DUMP

The dump of the memory pack is shown on the display.

### Procedure

(1) Enter the MEMORY TEST mode in according to steps (1) and (2) of “8. MEMORY TEST”.

(2) Input “2” to enter the MEMORY PACK DUMP mode.
The following MEMORY PACK DUMP display is shown at regular intervals on the display of the terminal.

```
[ MEMORY DUMP TEST ]

F : +100H
B : –100H

Q : QUIT

ADDRESS : 0  1  2  3  4  5  6  7  8  9  a  b  c  d  e  f :0123456789abcdef:
000000    :20 10 42 5a 53 2d 32 36 31 30 00 00 00 00 00 00 :.BZS-2610......:
000010    :56 65 72 2e 31 2e 30 30 00 00 00 00 00 00 00 00 :Ver.1.00........:
000020    :00 00 01 00 00 02 18 20 00 00 e7 1c 01 23 45 67 :....... .....#Eg:
000030    :00 00 00 00 00 00 00 00 00 00 00 00 89 ab cd ef :................:
000040    :00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 :................:
000050    :00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 :................:
000060    :00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 :................:
000070    :00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 :................:
000080    :00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 :................:
000090    :00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 :................:
0000a0    :00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 :................:
0000b0    :00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 :................:
0000c0    :00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 :................:
0000d0    :00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 :................:
0000e0    :00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 :................:
0000f0    :00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 :................:
```

(3) When “F” is input, the dump of the address added 100 to an address is displayed.
And when “B” is input, the dump of the address taken 100 from an address is displayed.
Example) “F” is input.

```
ADDRESS : 0  1  2  3  4  5  6  7  8  9  a  b  c  d  e  f :0123456789abcdef:
000100    :4e 56 00 00 4e b9 00 06 17 44 4e b9 00 04 00 1a :NV..N....DN.....:
000110    :4e b9 00 04 00 80 4e 5e 4e 75 4e 56 00 00 2f 0a :N.....N^NuNV../.:
000120    :20 3c 00 03 80 00 22 3c 00 03 a3 10 92 80 2f 01 : <....'<....../.:
000130    :2f 00 4e b9 00 06 17 b4 24 7c 00 d0 00 01 14 bc :/.N.....$|.......:
000140    :00 00 42 39 00 03 99 28 4e b9 00 04 52 d4 10 39 :..B9...(N...R..9:
000150    :00 03 99 28 00 00 00 08 13 c0 00 03 99 28 14 80 :...(.........(..:
000160    :4e b9 00 04 52 7c 4e b9 00 04 03 6c 4e b9 00 04 :N...R|N....1N...:
000170    :03 ce 4e b9 00 04 03 3c 24 6e ff fc 4e 5e 4e 75 :..N....<$n..N^Nu:
000180    :4e 56 00 00 4e b9 00 06 08 60 42 a7 4e b9 00 06 :NV..N....`B.N...:
000190    :0a 1c 58 4f 4a 80 6c f2 4e 5e 4e 75 4e 56 00 00 :..XOJ.1.N^NuNV..:
0001a0    :4e 5e 4e 75 4e 56 00 00 4e 5e 4e 75 10 03 00 00 :N^NuNV..N^Nu....:
0001b0    :00 04 01 8e 01 00 00 00 00 00 00 00 ff 00 00 00 :................:
0001c0    :00 00 00 00 ff 00 00 00 00 00 00 00 ff 00 00 00 :................:
0001d0    :00 04 00 00 00 00 00 00 ff 00 00 00 00 04 01 a8 :................:
0001e0    :02 00 00 00 00 00 00 00 ff 00 00 00 00 04 01 a8 :................:
0001f0    :02 00 00 00 00 05 00 00 00 00 00 00 ff 00 00 00 :................:
```

(4) When the address is input, the dump of that address is shown on the display.
Example) The dump of address 10000

```
ADDRESS : 0  1  2  3  4  5  6  7  8  9  a  b  c  d  e  f :0123456789abcdef:
010000    :00 03 99 24 70 00 30 10 7a 13 ba 80 6d 6e 7a 11 :...$p.0.z...mnz.:
010010    :ba 80 6e 68 48 78 02 15 4e b9 00 06 09 0a 60 5c :..nhHx..N.....`':
010020    :20 79 00 03 99 24 70 00 30 10 7a 13 ba 80 6d 20 :y...$p.0.z...m..:
010030    :7a 11 ba 80 6e 1a 1d 7c 00 03 ff fc 1d 7c 00 10 :z...n..|.....|..:
010040    :ff fd 1d 7c 00 93 ff fe 1d 7c 00 02 ff ff 60 22 :...|.....|....`':
010050    :7a 01 ba b9 00 03 8a d0 66 22 1d 7c 00 03 ff fc :z.......f'.|....:
010060    :1d 7c 00 10 ff fd 1d 7c 00 93 ff fe 1d 7c 00 01 :.|.....|.....|..:
010070    :ff ff 48 6e ff fc 4e b9 00 06 0e e0 70 00 4c ee :..Hn..N.....p.L.:
010080    :00 30 ff f4 4e 5e 4e 75 4e 56 ff f8 48 e7 0c 20 :.0..N^NuNV..H.. :
010090    :3a 2e 00 0a 70 00 30 05 76 10 b6 80 66 74 20 79 ::...p.0.v...ft y:
0100a0    :00 03 99 24 70 00 30 10 76 13 b6 80 6d 00 01 02 :...$p.0.v...m...:
0100b0    :76 11 b6 80 6e 00 00 fa 1d 7c 00 05 ff f8 1d 7c :v...n....|.....|:
0100c0    :00 10 ff f9 1d 7c 00 a1 ff fa 1d 79 00 03 a1 8c :.....|.....y....:
0100d0    :ff fb 10 39 00 03 a1 90 46 00 52 00 1d 40 ff fc :...9....F.R..@..:
0100e0    :0c 00 00 80 66 06 1d 7c 00 7f ff fc 42 2e ff fd :....f..|....B...:
0100f0    :28 0e 51 84 2f 04 45 f9 00 06 0e e0 4e 92 1d 7c :(.Q./.E.....N..|:
```

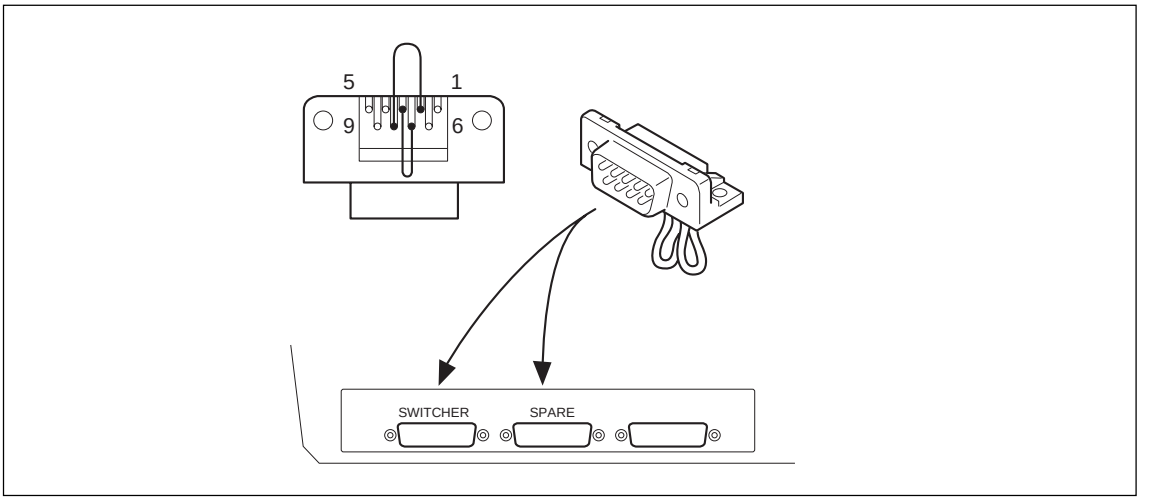
(5) To exit the MEMORY PACK DUMP mode, input “Q” once to return to the display at step (2) of “8. MEMORY TEST”, and input “Q” again.

## 9. COMM TEST

Checks that the control panel receives the data transmitted from the control panel and the received data corresponds to the transmitted data.
You need the following parts for this test.

### Parts

D-sub 9-pin connector plug (2 pcs) : Sony Parts No.; 1-566-318-21
Jumper wire




Short the jumper between 2 pin and 8 pin, and between 3 pin and 7 pin of the D-sub connector plug.
Connect the shorted connector plug to connector SWITCHER and SPARE at the rear panel of the BKDS-2010.

### Procedure

(1) Enter the self diagnosis mode according to the procedure in Section 6-2-2.
The menu is shown on the display of the terminal.
If continued from other test, proceed to step (2).
(2) Check that the tools of the connector plug are connected.
(3) Input “9” to enter the COMM TEST mode.
The following COMM TEST display is shown.
When the test ends, the display returns to the menu display automatically.

```
[ COMM TEST ]

SWITCHER PORT  : OK
SPARE        PORT  : OK
```

**OK**

```
[ COMM TEST ]

SWITCHER PORT  : NG
SPARE        PORT  : NG
```

**NG**

**Note**

When the connector plug is not connected to the connector SWITCHER or SPARE, NG is indicated at the position of not connected connector on the display.

## 6-3. Self Diagnostics of BKDS-2010 Not Using Terminal

BKDS-2010 is able to check the following functions without using the terminal.

### Checks

1. SW SCAN TEST
2. 7SEG TEST
3. VOLUME TEST
4. LCD TEST
5. MEMORY TEST

### 1. SW SCAN TEST

#### Procedure

(1) Check that the AC inlet is disconnected from the rear panel of the BKDS-2010.
(2) While pressing the NORM button on the control panel, connect the AC inlet to the rear panel to enter the SW SCAN TEST mode.
For the details of this test, refer to the step (3) and later of "1. SW SCAN TEST" in "6-2-3. Self Diagnosis".

### 2. 7SEG TEST

#### Procedure

(1) Check that the AC inlet is disconnected from the rear panel of the BKDS-2010.
(2) While pressing the NORM REV button on the control panel, connect the AC inlet to the rear panel to enter the 7SEG TEST mode.
For the details of this test, refer to the step (3) and later of "4. 7SEG TEST" in "6-2-3. Self Diagnosis".

### 3. VOLUME TEST

#### Procedure

(1) Check that the AC inlet is disconnected from the rear panel of the BKDS-2010.
(2) While pressing the REV button on the control panel, connect the AC inlet to the rear panel to enter the VOLUME TEST mode.
For the details of this test, refer to the step (3) and later of "5. VOLUME TEST" in "6-2-3. Self Diagnosis".

### 4. LCD TEST

#### Procedure

(1) Check that the AC inlet is disconnected from the rear panel of the BKDS-2010.
(2) While pressing the MULTI button on the control panel, connect the AC inlet to the rear panel to enter the LCD TEST mode.
For the details of this test, refer to the step (3) and later of "6. LCD TEST" in "6-2-3. Self Diagnosis".

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### 5. MEMORY TEST

#### Procedure

(1) Check that the AC inlet is disconnected from the rear panel of BKDS-2010.

(2) While pressing the ROTA-TION button on the control panel, connect the AC inlet to the rear panel to enter the MEMORY TEST mode.
For the details of this test, refer to the step (3) and later of “8. MEMORY TEST” in “6-2-3. Self Diagnosis”.

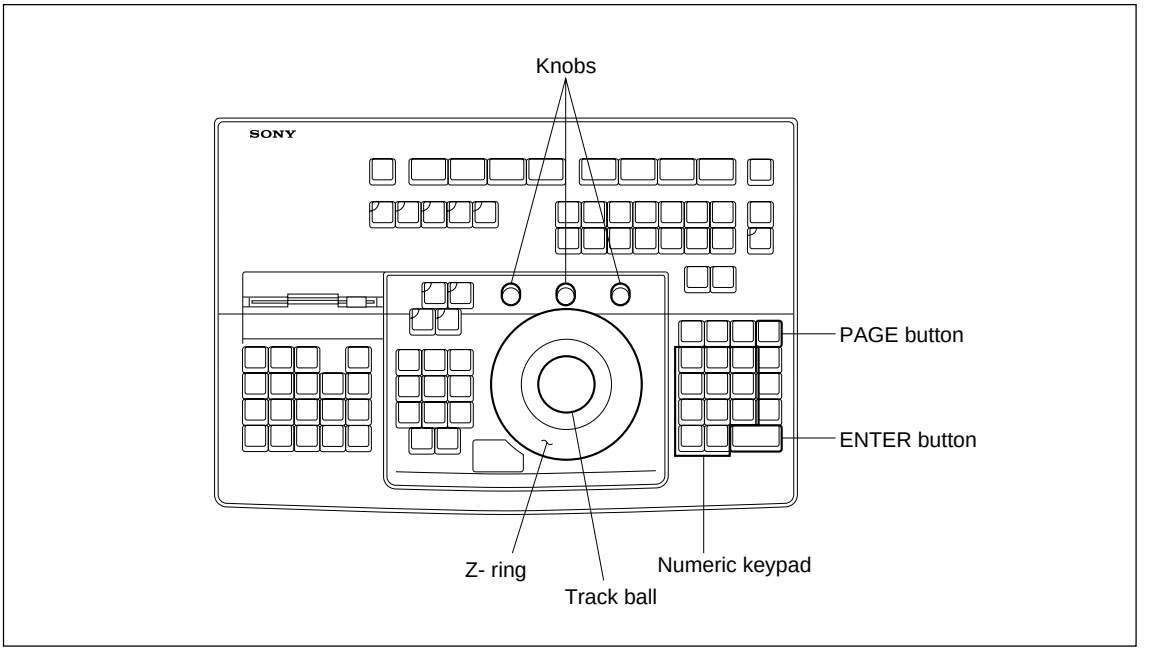
**Note**

When the MEMORY PACK CHECK in the MEMORY TEST is performed, the data in the pack is erased. Do not use the memory pack in which data is already saved.

# 6-4. Self Diagnostics of BKDM-3010 (Menu 804 page)

## 1. Starting up the Menu 804

Press the PAGE button, and enter 804 by the numeric keypad. Then press the ENTER button.
The menu 804 starts.



## 2. Check items

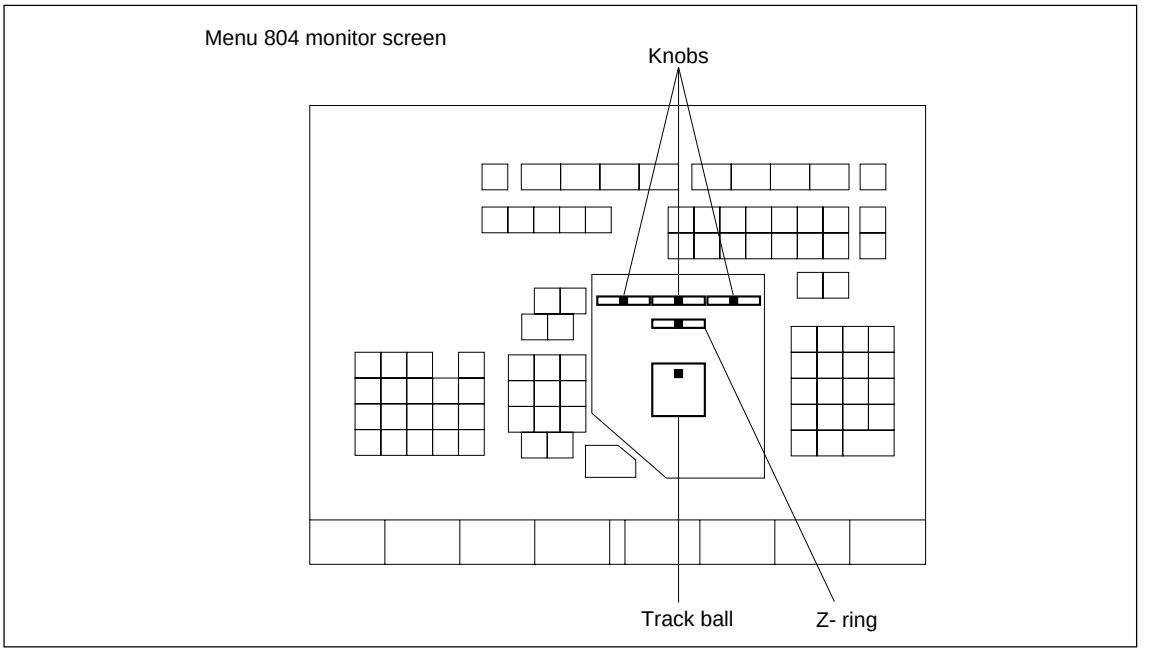
(1) Button check
Press the button on the control panel, and confirm that the color of the corresponding block on the monitor changes.

(2) LED of the button check
Press the button with LED on the control panel, and confirm that the LED lights up.
For the buttons with two-color LED (GLBL, CH1, CH2, CH3, CH4), confirm that the LED lights green and red alternately each time these buttons are pressed.

(3) Knob check
Turn the knob clockwise, and confirm that the point of the corresponding block on the monitor moves to the right.
Turn the knob counterclockwise, and confirm that the point of the corresponding block on the monitor moves to the left.

(4) Track ball check
Move the track ball in the right and left, up and down, and confirm that the point of the corresponding block on the monitor moves to the same directions.

(5) Z-ring check
Turn the Z-ring clockwise, and confirm that the point of the corresponding block on the monitor moves to the right.
Turn the Z-ring counterclockwise, and confirm that the point of the corresponding block on the monitor moves to the left.




## 3. Exiting the menu 804

Reset the control panel BKDM-3010. (Refer to Section 6-8 in the Installation Manual.)

# Section 7
# Periodic Maintenance and Inspection

## 7-1. Cleaning

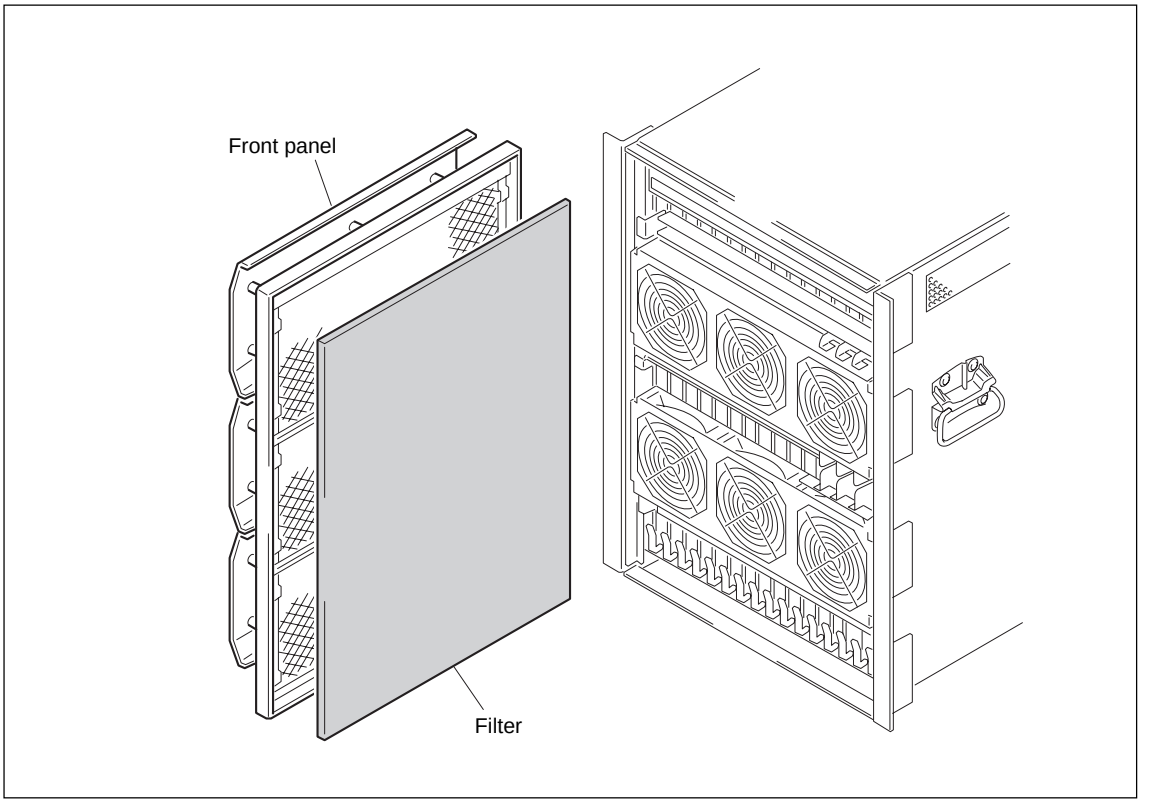
### 7-1-1. Filter

Clean periodically the filter at the back of the front panel because it is apt to catch dust.
It is recommended to replace the filter every five years.

(1) Remove the front panel. (Refer to Section 1-1-1.)
(2) Remove dust on the filter using a vacuum cleaner.

**Note**

If dust is caught heavily, it is recommended to wash the filter.
When washing the filter, be sure to dry it well.



## 7-1-2. Fan

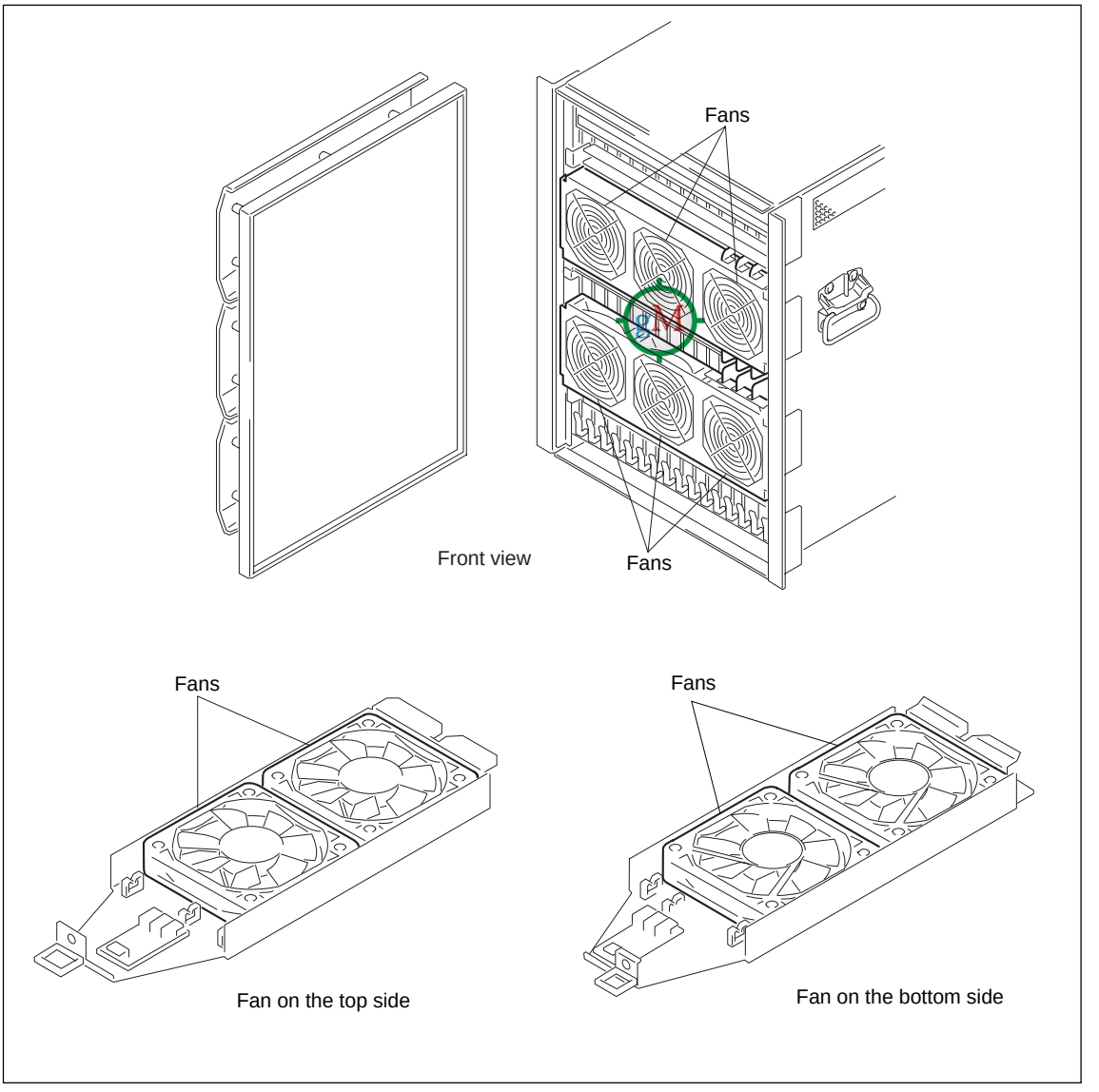
The temperature in the unit increases if dust is attached to the opening block of a fan and the air flow is disturbed. This may badly influence the performance and life of the unit.
It is recommended to clean the fans every one month.

### (Fan of Front side)

(1) Remove the front panel. (Refer to Section 1-1-1.)
(2) Remove dust on the fan and the fan guard using a vacuum cleaner.

### (Fan of Top and Bottom sides)

(1) Pull out the fan tray from the unit. (Refer to steps (1) and (7) of “1-3-3. Replacement of Fan on the Top Side”, or steps (1) through (6) of “1-3-4. Replacement of Fan on the Bottom Side”.)
(2) Remove dust on the fan using a vacuum cleaner.

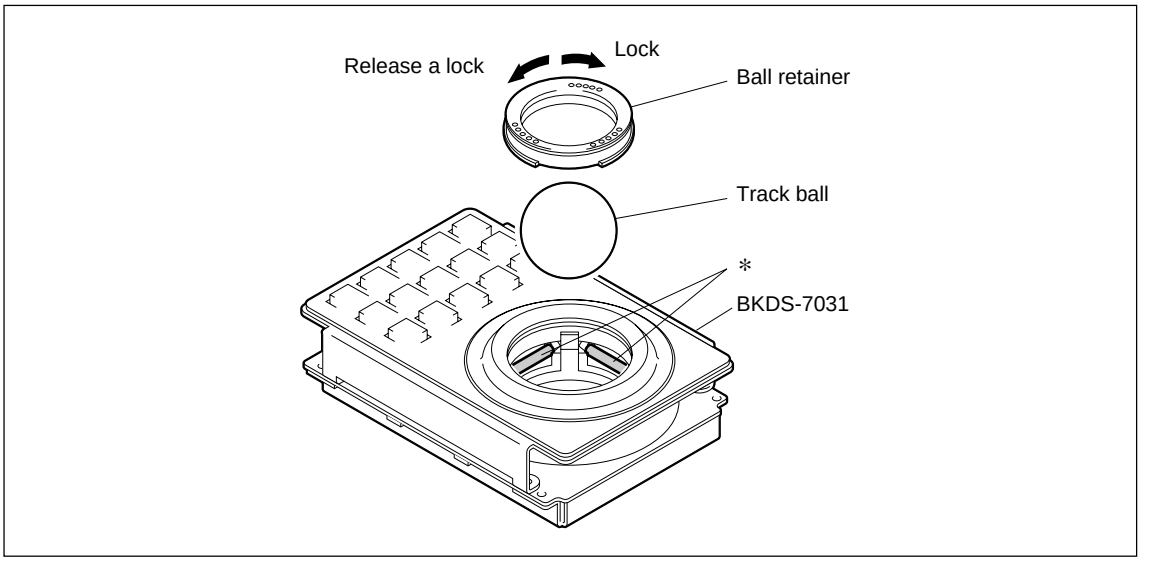


## 7-1-3. Track Ball

If the track ball has dirt, the display will not operate sometimes when moving the track ball.
It is recommended to clean the track ball every one month.

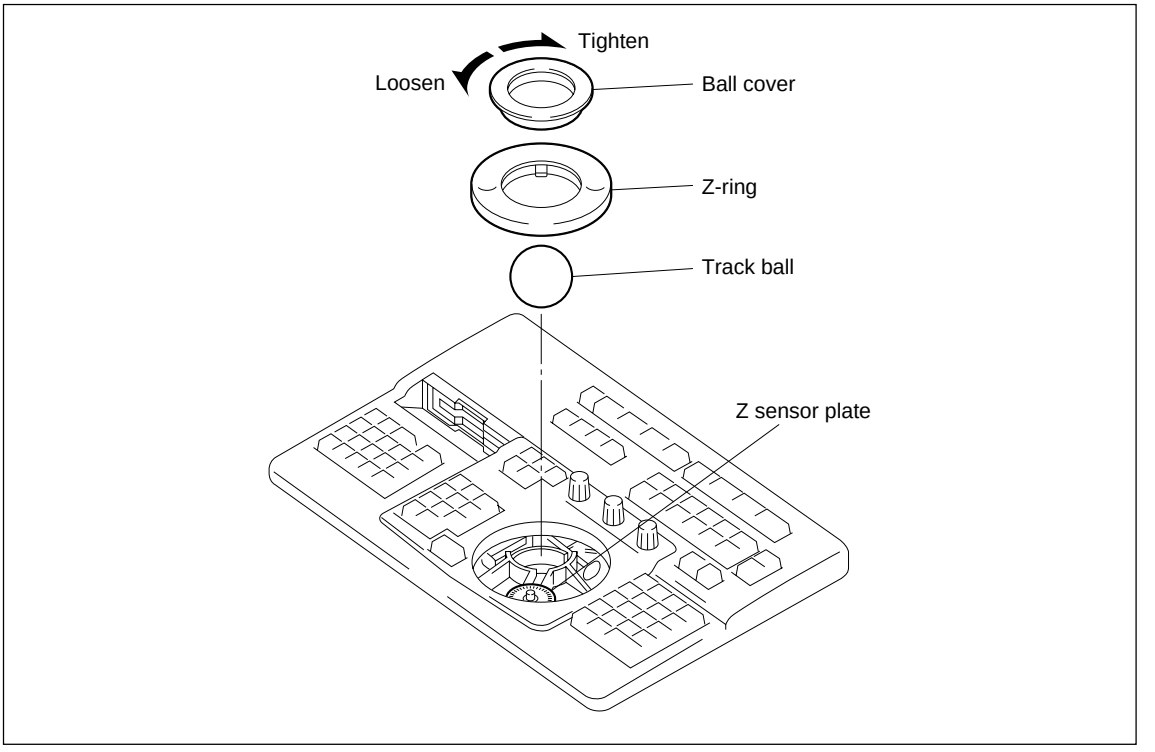
### BKDS-7031

(1) Open the panel of the BKDS-7017. (Refer to Section 2-1.)
(2) Turn off the power switch in the control panel. (Refer to Section 2-2.)
(3) When cleaning the track ball of BKDS-7031 installed to the adaptor box (BKDS-7075), remove the two screws and then remove the AD panel. (Refer to “2-3. Removal of Adaptor Box”.)
(4) Turn the ball retainer counterclockwise to release a lock.
(5) Push up the track ball from the hole on the KY-329 board and remove the track ball and ball retainer.
(6) Wipe the track ball and the ⁎-marked portions in the figure by a soft cloth.
(7) Install the track ball and ball retainer.
(8) Turn the ball retainer clockwise to lock.



**BKDM-3010**

(1) Turn the ball cover counterclockwise and loosen it, then remove.
(2) Catch the Z-ring on a nail, raise it, then remove.
(3) Remove the track ball and clean it with soft cloth.
(4) Put a track ball in the position shown in the figure.
(5) Push in the Z-ring while pressing it against the Z sensor plate.
(6) Turn the ball cover clockwise and tighten it.

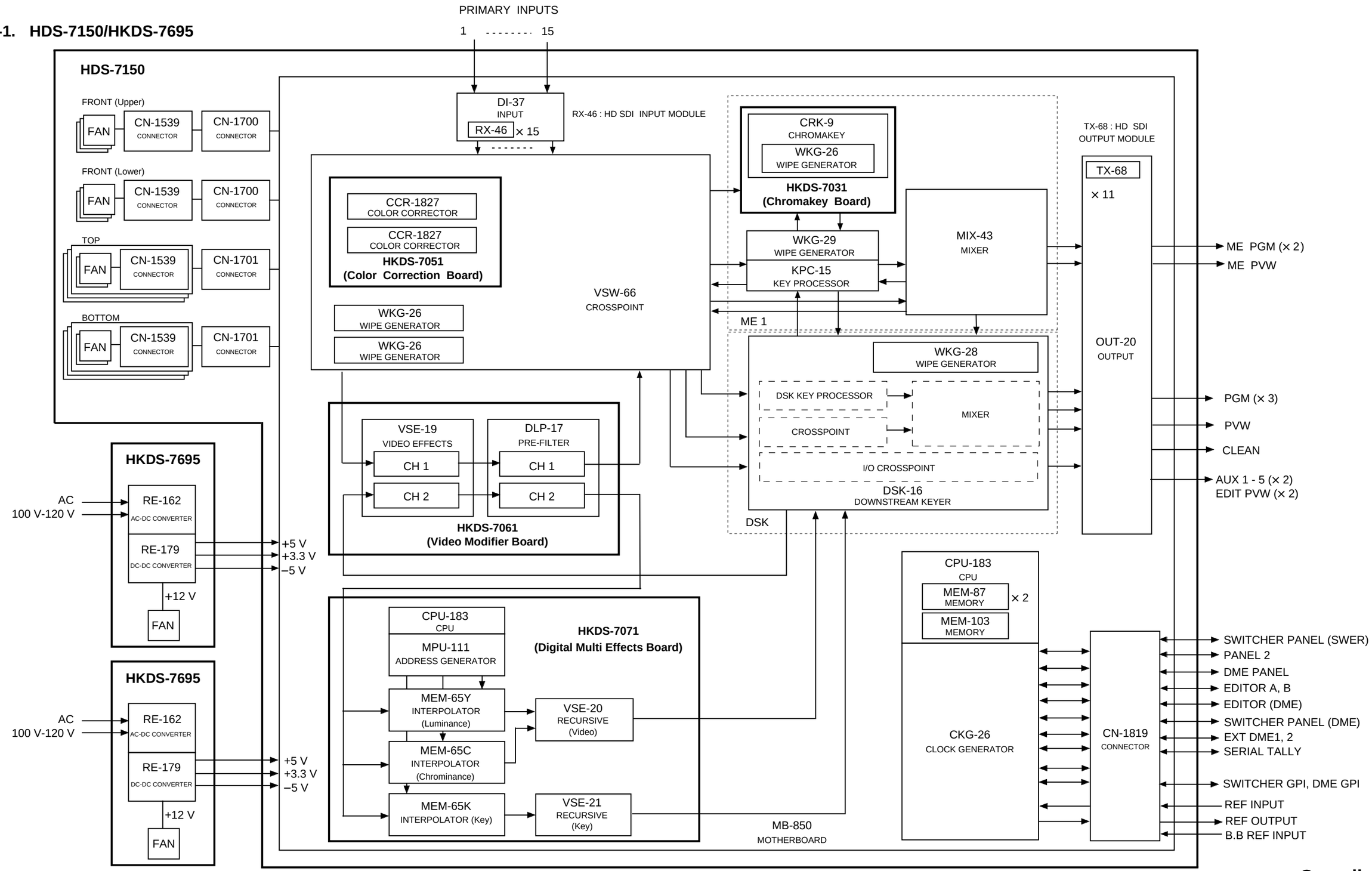



## 7-1-4. Caution When Cleaning the LED (BKDS-7003)

When cleaning the LED unit on the LE-147, LE-148, or LE-180 board, use a dry cloth or a cloth moistened with a small amount of water. If using a cloth moistened with a solvent (alcohol and the like), it is possible to be whiten and crack on the surface of the LED unit.

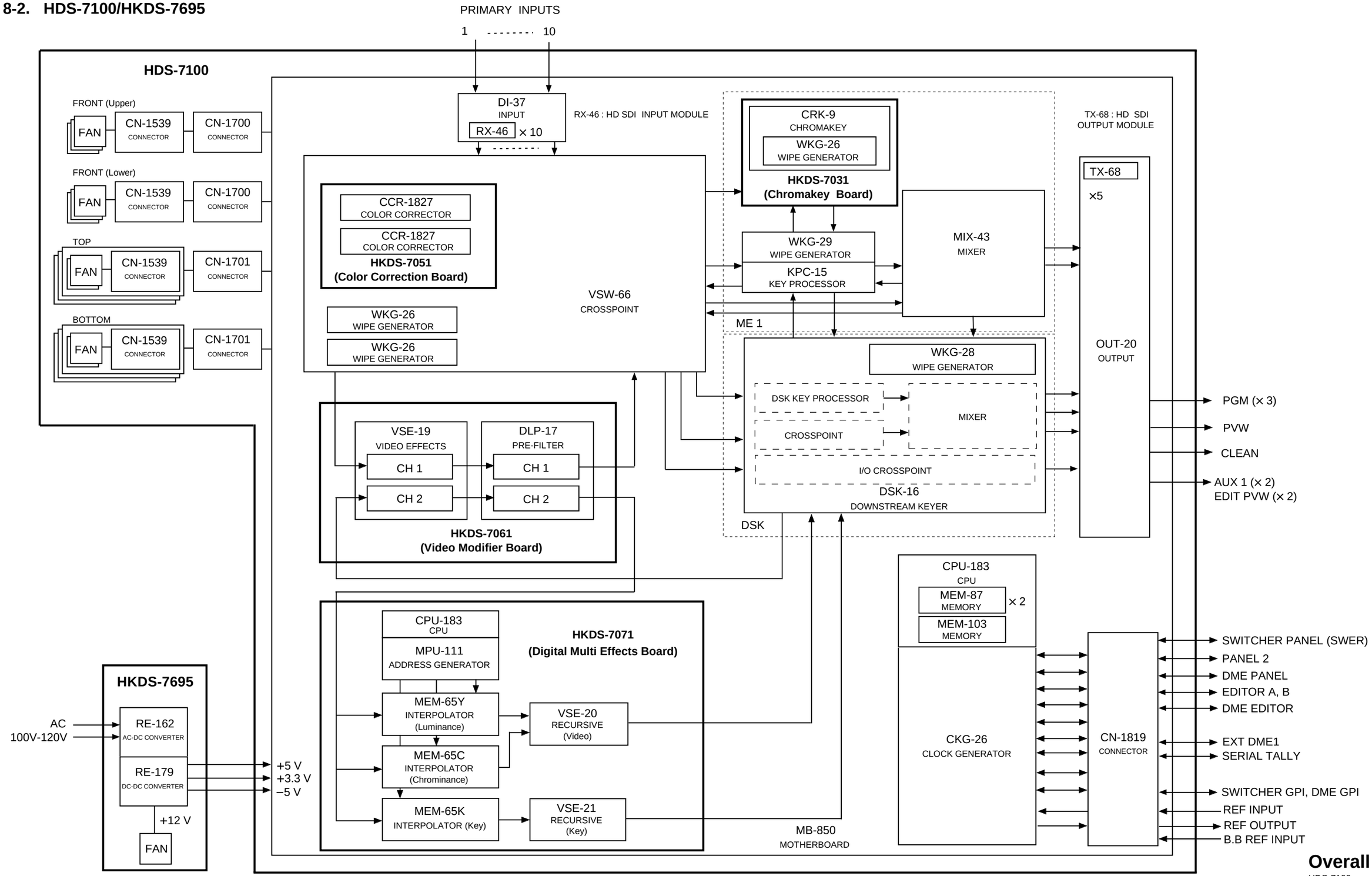
# Section 8
# Overall Block Diagrams

## 8-1. HDS-7150/HKDS-7695




**Overall**
HDS-7150

## 8-2. HDS-7100/HKDS-7695




**Overall**
HDS-7100

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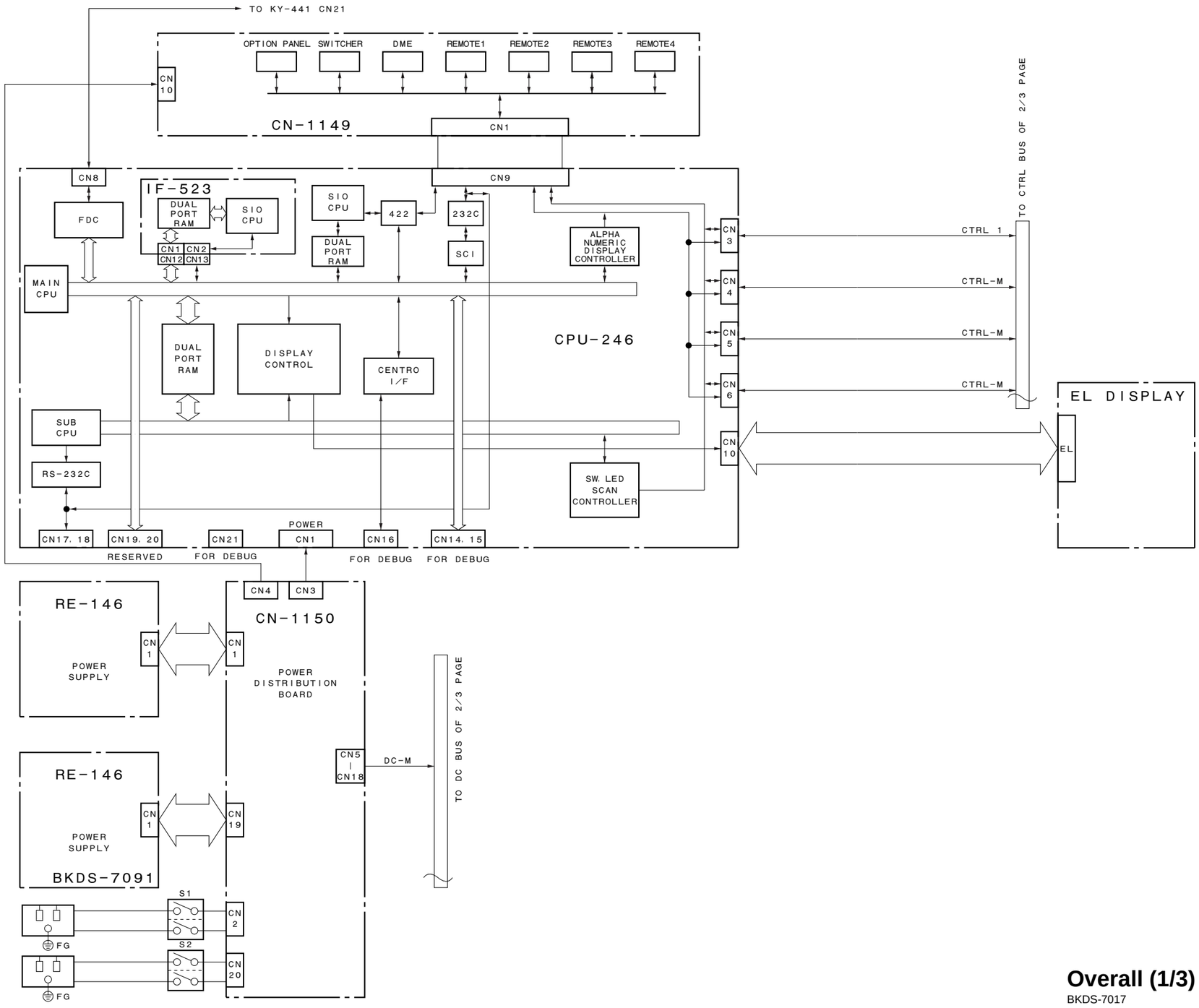
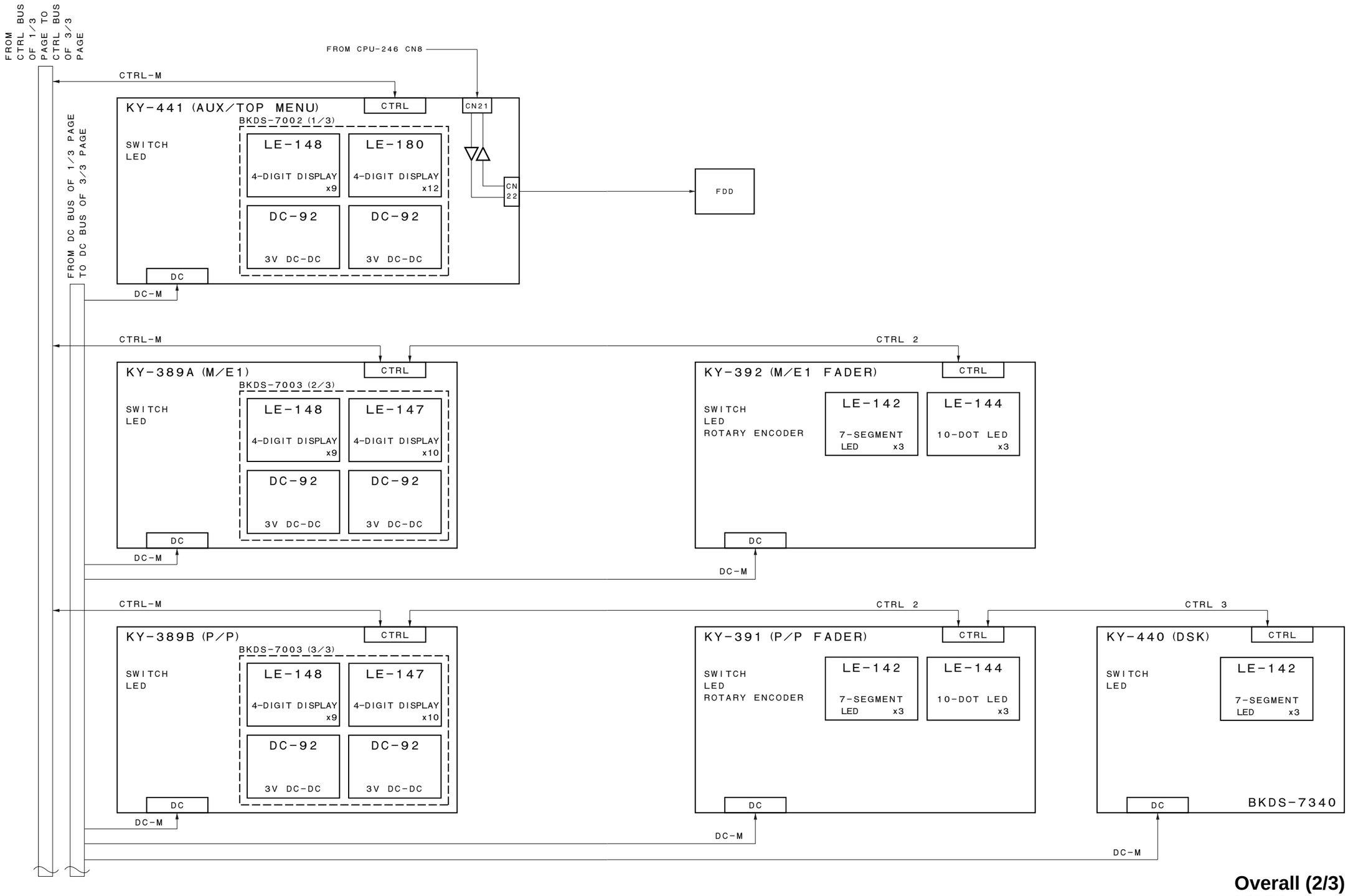
## 8-3. BKDS-7017

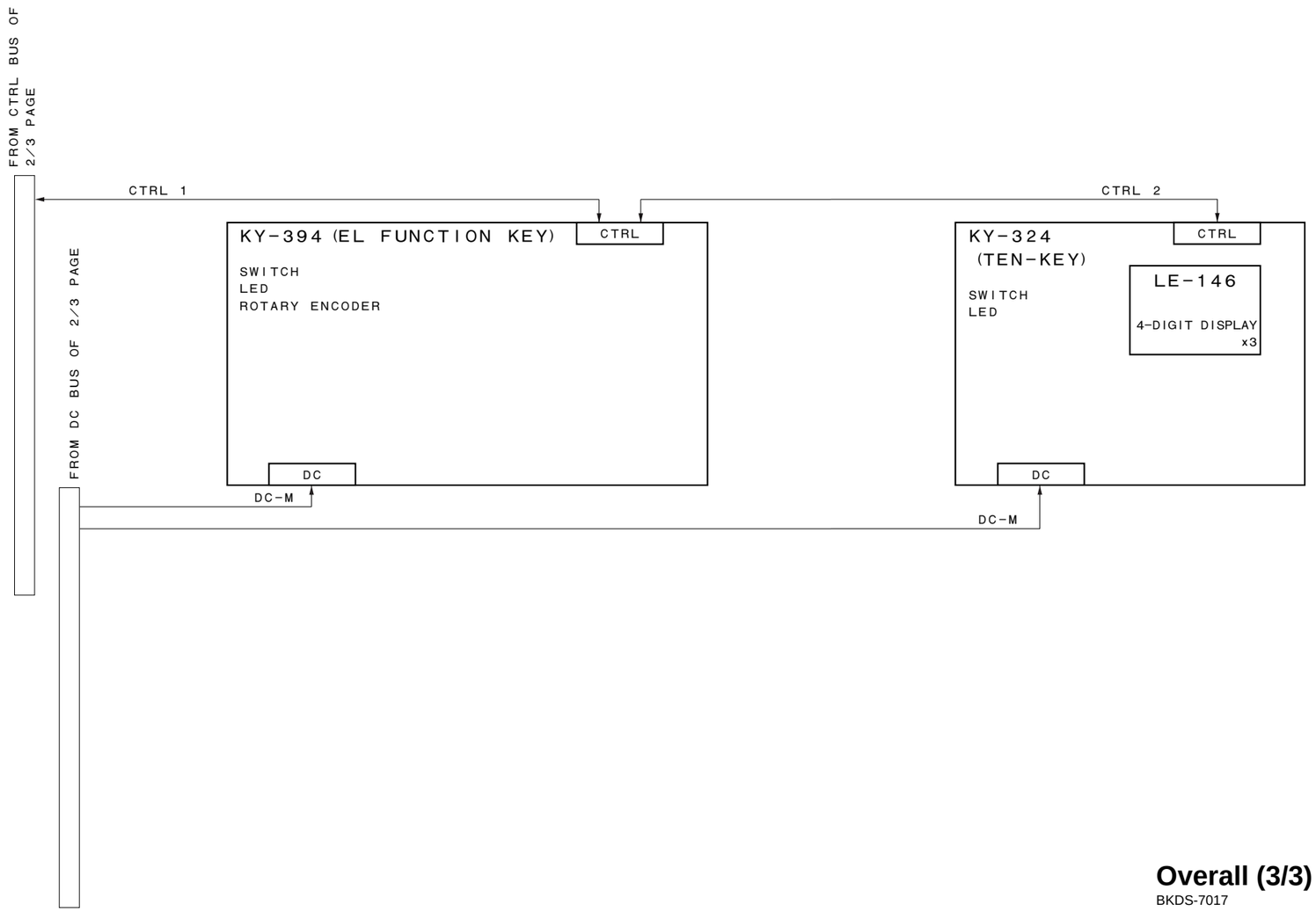



**Overall (1/3)**
BKDS-7017




**Overall (2/3)**
BKDS-7017

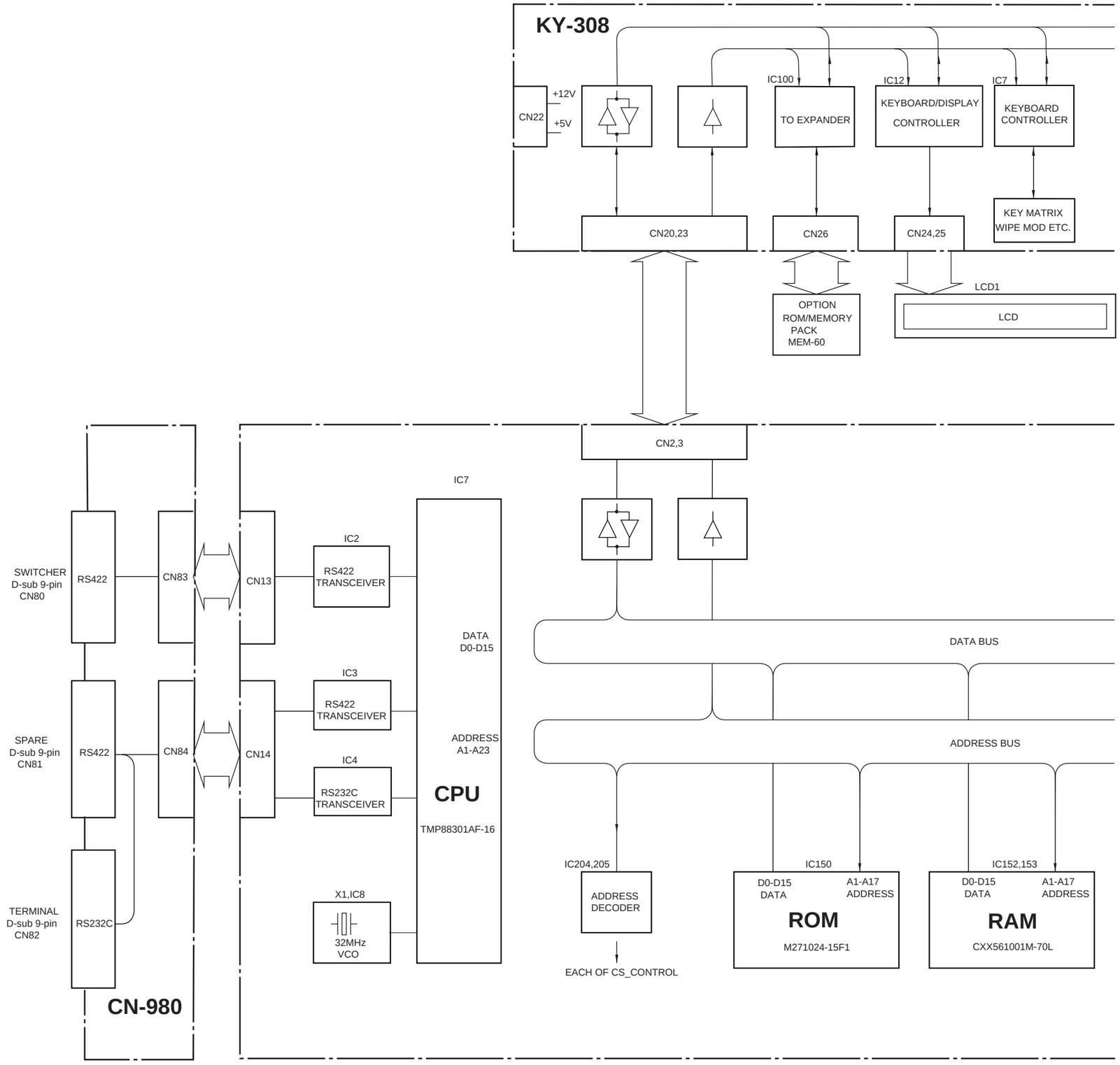
BKDS-7017 (3/3) Overall

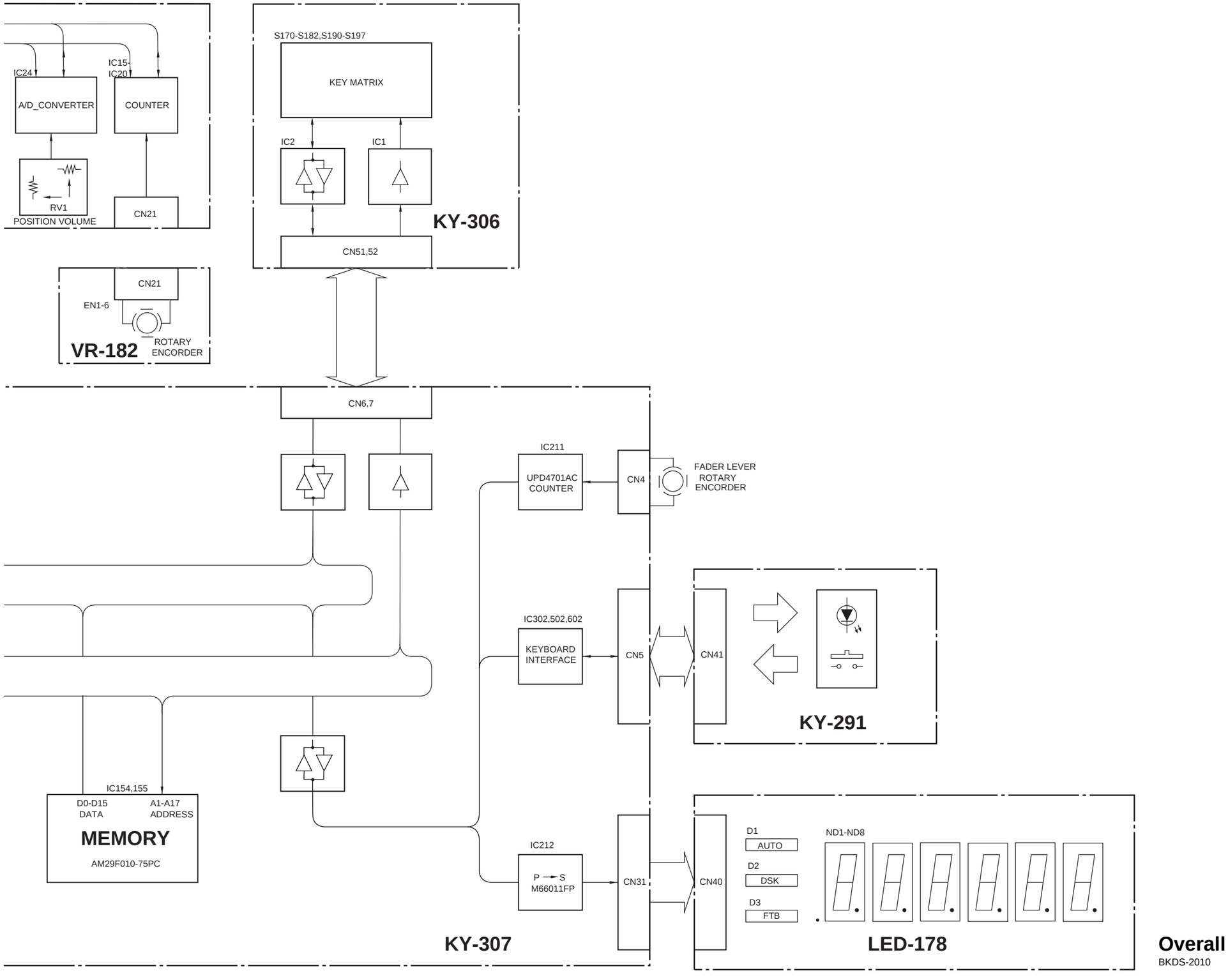



## Overall (3/3)
BKDS-7017


8-5

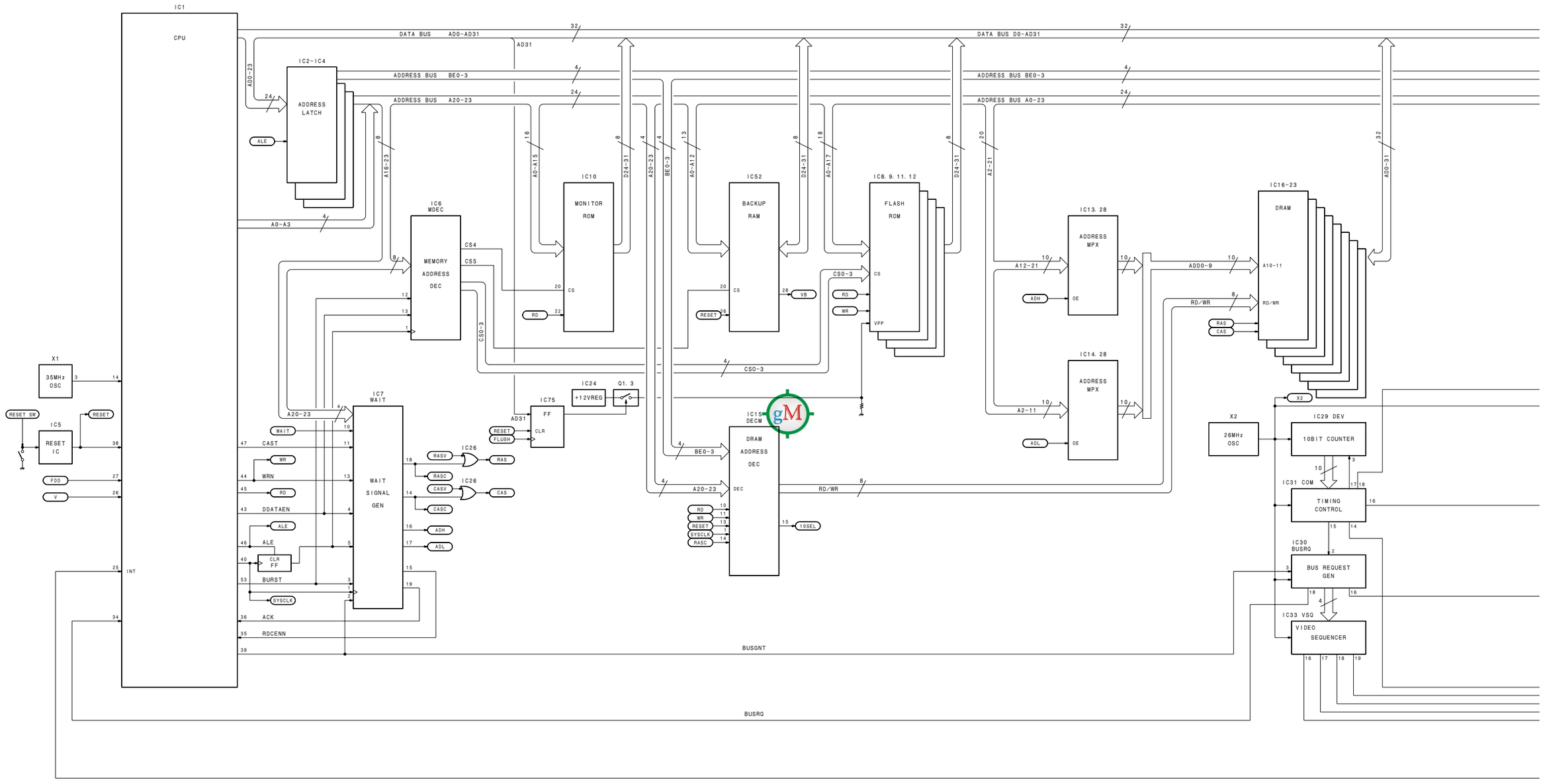
## 8-4. BKDS-2010

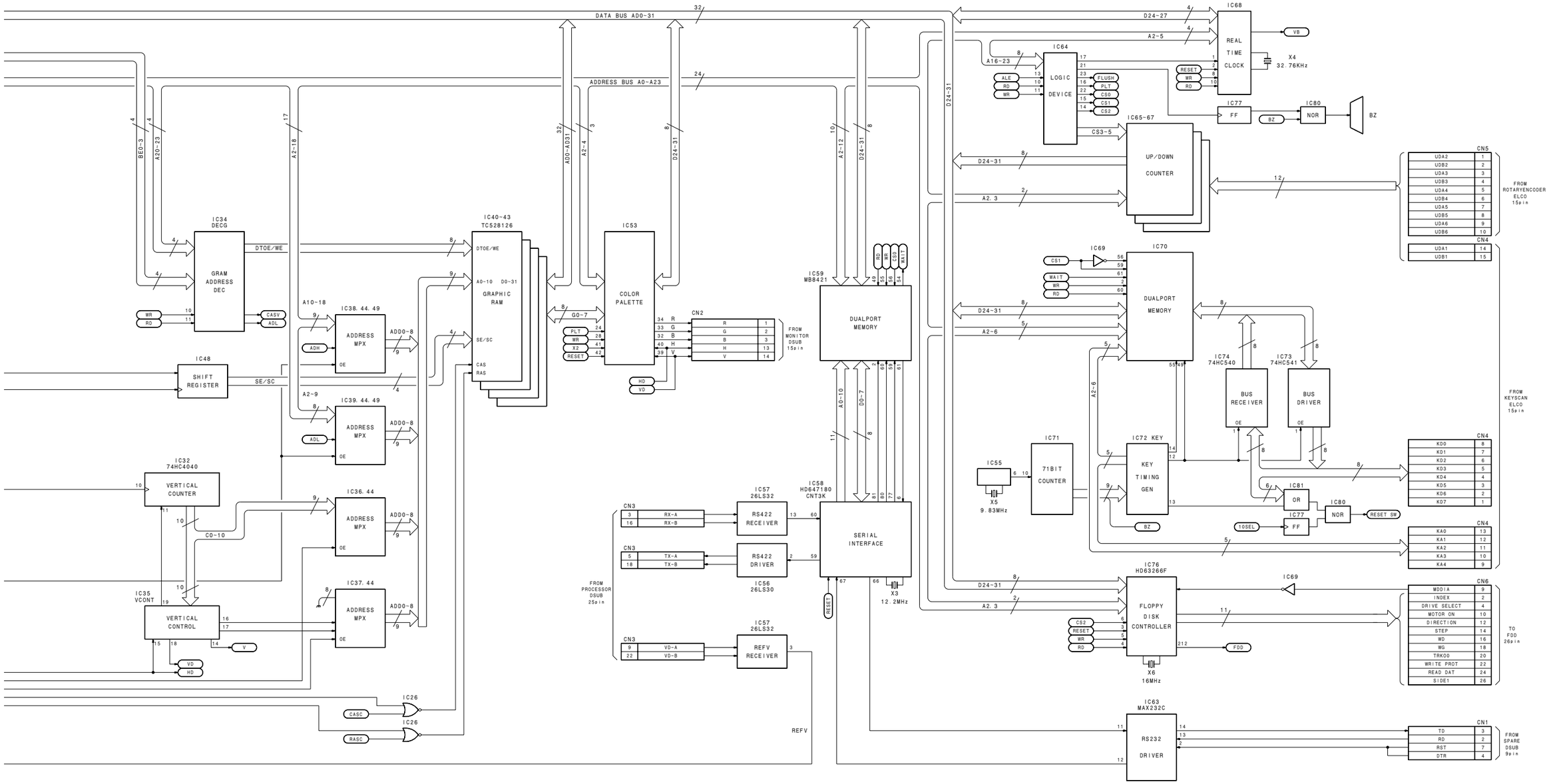

KY-308
CN22
+12V
+5V
IC100
TO EXPANDER
IC12
KEYBOARD/DISPLAY CONTROLLER
IC7
KEYBOARD CONTROLLER
KEY MATRIX WIPE MOD ETC.
CN20,23
CN26
CN24,25
LCD1
OPTION ROM/MEMORY PACK MEM-60
LCD
CN2,3
IC7
SWITCHER D-sub 9-pin CN80
RS422
CN83
CN13
IC2
RS422 TRANSCEIVER
SPARE D-sub 9-pin CN81
RS422
CN84
CN14
IC3
RS422 TRANSCEIVER
IC4
RS232C TRANSCEIVER
TERMINAL D-sub 9-pin CN82
RS232C
X1,IC8
32MHz VCO
DATA D0-D15
ADDRESS A1-A23
CPU
TMP88301AF-16
DATA BUS
ADDRESS BUS
IC204,205
ADDRESS DECODER
EACH OF CS_CONTROL
IC150
D0-D15 DATA
A1-A17 ADDRESS
ROM
M271024-15F1
IC152,153
D0-D15 DATA
A1-A17 ADDRESS
RAM
CXX561001M-70L
CN-980




**Overall**
BKDS-2010

## 8-5. BKDM-3010


IC1
CPU
DATA BUS AD0-AD31
AD31
DATA BUS D0-AD31
ADDRESS BUS BE0-3
ADDRESS BUS A20-23
ADDRESS BUS A0-23
IC2-IC4
ADDRESS LATCH
ALE
A0-23
A0-A3
A16-23
A0-A15
D24-31
A20-23
BE0-3
A0-A12
A0-A17
A2-21
A12-21
A10-11
A0D0-9
RD/WR
RAS
CAS
IC6
MDEC
MEMORY ADDRESS DEC
CS4
CS5
CS0-3
IC10
MONITOR ROM
IC52
BACKUP RAM
IC8. 9. 11. 12
FLASH ROM
IC13. 28
ADDRESS MPX
IC14. 28
ADDRESS MPX
IC16-23
DRAM
IC15
DECM
DRAM ADDRESS DEC
IC24
+12VREG
Q1. 3
IC75
FF
IC7
WAIT
WAIT SIGNAL GEN
IC26
X1
35MHz OSC
IC5
RESET IC
RESET SW
FDD
V
INT
CAST
WRN
DDATAEN
BURST
ACK
RDCENN
BUSGNT
BUSRQ
X2
26MHz OSC
IC29 DEV
10BIT COUNTER
IC31 COM
TIMING CONTROL
IC30 BUSRQ
BUS REQUEST GEN
IC33 VSQ
VIDEO SEQUENCER




**Overall**
BKDM-3010

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## SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer :

Check the metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

### LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 3.5 mA. Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 5.25 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 20 V AC range are suitable. (See Fig. A)

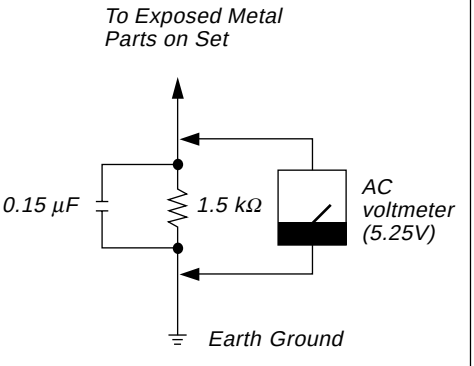


*Fig A. Using an AC voltmeter to check AC leakage.*

HDS-7150 (UCJ)
HDS-7100 (UCJ)
HKDS-7695 (JN)
BKDS-7017 (SY)
BKDS-2010 (SY)
BKDM-3010 (SY)
HKDS-7031 (UCJ)
HKDS-7051 (UCJ)
HKDS-7061 (UCJ)
HKDS-7071 (UCJ)
HZS-7040 (E)
HZS-7060 (E)
BKDS-7001 (SY)
BKDS-7003 (SY)
BKDS-7030 (SY)
BKDS-7031 (SY)
BKDS-7033 (SY)
BKDS-7075 (SY)
BKDS-7091 (SY) E

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